Ontario

Ontario Geological Survey
Open File Report 6110

Report of Activities, 2002 Resident Geologist Program

Red Lake Regional Resident Geologist Report:

Red Lake and Kenora Districts

2003

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ONTARIO GEOLOGICAL SURVEY

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Red Lake Regional Resident Geologist Report:
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by

A. Lichtblau, C. Ravnaas, C.C. Storey, A. Raoul, L. Kosloski and S. Wilson

2003

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Mines and Minerals Division Regional and District Offices

CITY	ADDRESS	OFFICE(S)	TELEPHONE	FAX
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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES - 2002

RED LAKE REGIONAL RESIDENT GEOLOGIST REPORT

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Ontario

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by

A. Lichtblau, C.C. Storey and L. Kosloski

2003

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RED LAKE REGIONAL RESIDENT GEOLOGIST (RED LAKE DISTRICT)–2002

A. Lichtblau[1], C.C. Storey[2] and L. Kosloski[3]

[1]Regional Resident Geologist, Red Lake–Kenora, Resident Geologist Program, Ontario Geological Survey

[2]District Geologist, Red Lake District, Resident Geologist Program, Ontario Geological Survey

[3]District Support Geologist, Red Lake District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

Gold was the only commodity mined in the Red Lake District in 2002. Total yearly production increased by 5% over the previous year, to 715 000 ounces gold (Table 1). This is now the second year of a more than doubled annual production of approximately 300 000 ounces gold, sustained over the previous 15 years (Figure 1).

Approximately 1107 tonnes of quartz were quarried from Kafka Granite LLC's Corless Quartz property in Little Bear Lake and Knott Township map area. The high purity stone is sold as decorative ground cover at Kafka's facilities in Wisconsin, USA.

Table 1. Mine production and reserves in the Red Lake District in 2002.

Mine	Production to end of 2001		Production in 2002		Reserves at end of 2002	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Goldcorp Inc. Red Lake Mine[1]	246 618 tons @ 2.26 opt Au (223 728 tonnes @77.50 g/t gold)	503 385 ounces Au	239 482 tons @ 2.29 opt Au (217 254 tonnes @ 77.49 g/t Au)	525 930 ounces Au	3 465 000 tons (3 143 000 tonnes)	1.48 opt Au (50.7 g/t Au)
Placer Dome (CLA) Ltd. Campbell Mine[2]	438 000 tonnes @13.3 g/t gold (482 800 tons @ 0.388 opt Au)	178 139 ounces Au	393 500 tons @ 0.51 opt Au (357 000 tonnes @ 17.5 g/t Au)	193 150 ounces Au	2 654 000 tons (2 408 000 tonnes)	0.48 opt Au (16.5 g/t Au)

(1) Goldcorp Inc., News release, February 11, 2003.
(2) Placer Dome Inc., News release, February 19, 2003.

The price of gold rose to approximately US$347 at year-end, an increase of 25% relative to the price at year-end 2001. Claim staking activity increased dramatically over the previous year (Table 2). The focus of new staking was in the Birch–Uchi and Confederation greenstone belts, where gold and, to a lesser degree, base metals and Cu-Ni-PGE were the commodities sought. Most open ground in the Red Lake belt was also staked. Diamonds and Cu-Ni-PGE targets were the focus of a small amount of staking in the Sachigo Subprovince.

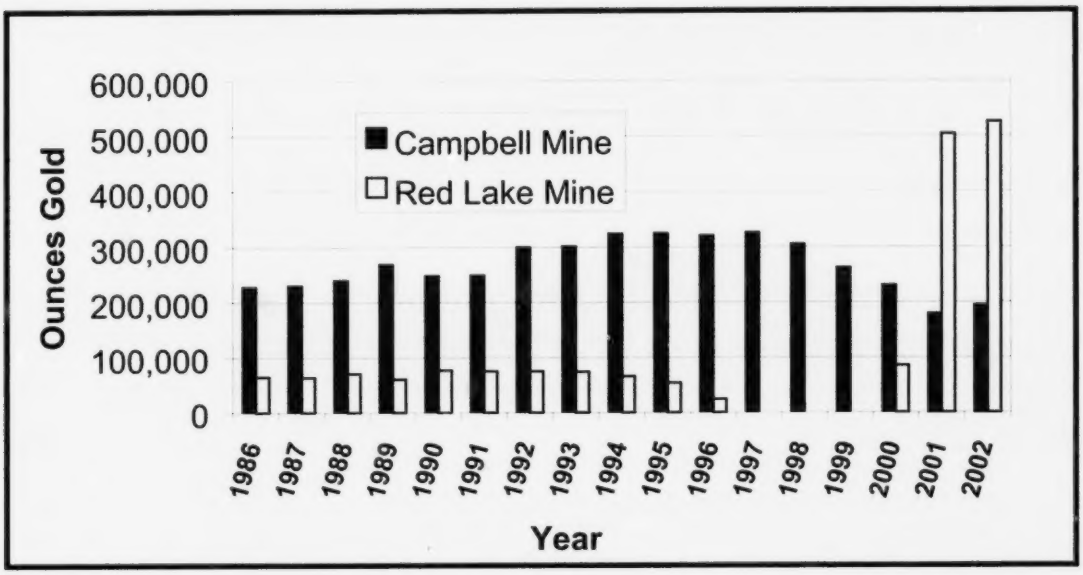

Figure 1. Annual gold production from the Campbell–Red Lake deposit, 1986–2002. No production at the Red Lake Mine between 1997 and 1999 due to strike by unionized employees.

Table 2. Summary of claims recorded in the Red Lake District, 2002.

Year	Claim Units Cancelled	Claim Units Recorded	Claim Units Active
2002	1795	7689	15 732
2001	290	291	2269

During 2002, 79 assessment work reports were submitted detailing exploration and development work totalling $2 396 211.

Staff of the Resident Geologist's office made 20 visits to active and inactive mineral properties during the year, focussing on delivering high-quality services to the exploration and mining sector. The role of minerals and mining was explained and demonstrated to elementary school students during visits to several Keewaytinook Okimakanak communities.

MINING ACTIVITY

Gold production in Red Lake continued at Goldcorp Inc.'s Red Lake Mine and at Placer Dome (CLA) Ltd.'s Campbell Mine. Historical statistics for all producers in the district are given in Table 3.

Goldcorp Inc. – Red Lake Mine

Gold production increased by 4.5% over previous year's results; the decreased daily mill throughput (from 676 to 656 tons per day) was offset by a slightly increased head grade (from 2.26 to 2.29 ounces gold per ton) and increased gold recovery (from 88.5% to 90.8%). Total operating cost was US$94 per ounce gold, with cash costs at US$65 per ounce gold.

Table 3. Gold production in the Red Lake District to December 31, 2002.

MINE	YEARS OF PRODUCTION	ORE MILLED (SHORT TONS)	GOLD PRODUCED	
			TROY OUNCES	OUNCES PER TON
CAMPBELL	1949–PRESENT[1]	18 373 351	10 528 398	0.573
GOLDCORP (DICKENSON)	1948–PRESENT[1,2]	8 858 490	4 262 634	0.481[3]
MADSEN	1938–1976, 1997[4]–1999	8 678 143	2 452 388	0.283[5]
COCHENOUR–WILLANS	1939–1971	2 311 165	1 244 279	0.538[6]
McKENZIE RED LAKE	1935–1966	2 353 833	651 156	0.277
HOWEY	1930–1941, 1957[7]	4 630 779	421 592	0.091[8]
HASAGA	1938–1952	1 515 282	218 213	0.144
STARRATT OLSEN	1948–1956	907 813	163 990	0.181
BERENS RIVER	1939–1948	560 607	157 341	0.281
UCHI	1939–1943	757 074	114 467	0.151
JASON (ARGOSY)	1934–1952	276 573	101 875	0.368
H.G.YOUNG	1960–1963	288 179	55 244	0.192
SACHIGO RIVER	1938–1941	46 457	52 560	1.131
McMARMAC	1940–1948	152 978	45 246	0.296
GOLD EAGLE	1937–1941	180 095	40 204	0.223
JACKSON MANION	1934–1940	105 357	27 142	0.258
RED LAKE GOLD SHORE	1936–1938	86 333	21 100	0.244
HUDSON PATRICIA	1936–1937	11 228	1857	0.165
BUFFALO	1981–1982	31 986	1656	0.052
ABINO	1985–1986	2733	1397	0.511
LAKE ROWAN	1986–1988	13 023	1298	0.100
KOSTYNUK BROTHERS	1963–1966	577	1126	1.951
BOBJO	1929	N/A	362[9]	N/A
BATHURST	1927–1937	562	307	0.546
RED SUMMIT	1935–1936	591	277	0.469
MOUNT JAMIE	1976	552	265	0.48
SOL D'OR	1933–1936	458	258	0.563
McFINLEY	1987	N/A	N/A	N/A
TOTAL		**50 144 219**	**20 566 632**	**0.410**

NOTES: (1) Includes final production figures for 2002.
(2) For 1997, 1998 and 1999 no production due to strike by unionized employees.
(3) From 1970, includes production from Robin Red Lake.
(4) Includes clean up ore and materials from the mine site.
(5) Historic grade, actual grade for 1999 was 0.14 ounce per ton gold.
(6) Includes production from Annco and Wilmar properties.
(7) Continuous production 1930 to 1941; includes 268 ounces recovered from clean up in 1957.
(8) The ore mined at Howey, before sorting totalled 5 158 376 tons.
The average production from run-of-mine ore was therefore 0.0817 ounce per ton gold.
(9) Not included in total production figure
N/A Data not available

Total ore reserves, from all categories, increased by approximately 19% at year-end 2002:

Category	Tons	Grade ounces gold per ton	Contained ounces gold
High Grade Ore			
Proven	1 007 000	2.27	2 287 000
Probable	950 000	2.43	2 307 000
Sub-total	1 957 000	2.35	4 594 000
Sulphide Ore			
Proven	361 000	0.40	143 000
Probable	1 147 000	0.34	390 000
Sub-total	1 508 000	0.35	533 000
Total Reserves	**3 465 000**	**1.48**	**5 127 000**

Early in 2003, Goldcorp announced it would go ahead with an expansion of the Red Lake Mine. A new shaft, with a hoisting capacity of 4000 tons per day, will be sunk to 7150 feet (2179 m). Production rate will be expanded to 1000 tons per day (80% from the High Grade Zone; 20% from the Sulphide Zones) to produce approximately 740 000 ounces gold annually within 3 years of project start-up. Capital costs (including mill expansion) are forecast to be approximately US$85 million, with a payback of 1.2 years (at a gold price of US$325 per ounce).

Goldcorp's US$12 million underground exploration efforts targeted 4 areas:

1) **High Grade Zone** ("HGZ") has been extended to approximately 2210 m (7250 feet) vertically below surface. At this depth, hole 37L034 intersected what is interpreted to be the thinner and lower grade margins of the HGZ, which included assays of 31.1 g/t gold over 1.22 m (0.91 ounces gold per ton over 4.0 feet) and 41.5 g/t gold over 1.83 m (1.21 ounces gold per ton over 6.0 feet). A wedge-off from this hole intersected four zones of gold mineralization within a wider zone of mineralization totalling 59 m (194 feet) representing the main body of the HGZ. Intersections at a vertical depth of 2144 m (7035 feet) included 251.7 g/t gold over 4.27 m (7.34 ounces gold per ton over 14.0 feet) and 109.0 g/t gold over 4.11 m (3.18 ounces gold per ton over 13.5 feet). The maximum depth of HGZ reserves at year end 2002 was increased to 6475 feet (1974 m) compared with 5950 feet (1814 m) at year end 2001.

2) **Far East Zone** has been drilled from two underground locations, the 16 Level (732 m or 2400 feet below surface) and 34 Level (1525 m or 5000 feet below surface). Results from the 16 Level drilling indicate that the mineralization lies along the upward extension of the main HGZ structure, and that mineralization intersected from 34 Level drilling belongs to a parallel structure to the east.

3) exploration drilling also focussed on establishing continuity of auriferous **sulphide mineralization** below previously mined areas (totalling approximately 3.2 million ounces gold produced between 1948 and 1996 and mined down to 4400 feet or 1341 m). Gold mineralization was encountered down to a vertical depth of 2134 m (7000 feet), where high grade zones such as 79.5 g/t gold over 0.55 m (2.32 ounces gold per ton over 1.8 feet) and wider, lower grade zones of up to 11.1 g/t gold over 5.12 m (0.32 ounces gold per ton over 16.8 feet) were intersected.

4) **Western Complex**, an underexplored area west of the High Grade Zone, is interpreted to host a similar type of mineralization as the HGZ. One hole intersected 13.6 g/t gold over 0.91 m (0.40 ounces gold per ton over 3.0 feet) at a vertical depth of 1524 m (5000 feet).

The mine had 124 company and 355 contract staff employed at year-end; Claude Lemasson was Mine Manager.

Placer Dome (CLA) Ltd. – Campbell Mine

The internal re-organization and cost-cutting measures, implemented in 2001, continue to positively affect the financial performance of the operation. The mine saw an 8% increase in the number of ounces poured, a 32% increase in grade and a 17% decrease in cash cost (from US$208 to US$172 per ounce gold).

A total budget of approximately $8.1 million was allocated to underground exploration in 2002; the DC Zone is now estimated to contain a resource of approximately 425 000 ounces of gold, including approximately 325 000 ounces at a grade of 0.54 ounce gold per ton. Total reserves in all zones at year-end are

Category	Tonnes	Grade (g/t)	Contained ounces gold
Proven	633 000	18.9	384 000
Probable	1 775 000	15.7	895 000
Total Reserves	**2 408 000**	**16.5**	**1 279 000**

A 236 000 ounce increase in contained ounces gold is in part due to continued successful delineation of the DC Zone. The marked increase in the price of gold has decreased the cut-off grade, which, in effect, increases reserve and resource ounces. The DC Zone accounted for 425 000 ounces gold in the overall reserve figure. Approximately $8.2 million will be spent in 2003 to further delineate this zone. A ramp from the 36-Level to the 43-Level will be constructed to commence mining the DC Zone. Approximately $27 million is budgeted for this development project, planned to be completed in 3 years.

Drilling from the 39- and 27-Levels returned 5 intercepts of vein stockwork mineralization interpreted to be hosted by the Bruce Channel assemblage, located approximately 1200 m (4000 feet) northeast of the Reid Shaft. Significant gold intersections, including 0.30 ounces gold per ton over 18.0 feet and 0.22 ounces gold per ton over 11.3 feet were encountered. The new zone is open on strike, to depth and to surface.

The mine had 355 employees at year-end. Jacques Perron was Mine Manager until August, when Peter Busse took over.

EXPLORATION ACTIVITY

Assessment work received is listed in Table 4, and a summary of exploration activity is given in Table 5. The slow but steady increase in the price of gold throughout the year sustained high exploration interest in the Red Lake District. Diamond and Cu-Ni-PGE exploration activity in neighbouring districts spilled over into the Sachigo Subprovince of the Red Lake District.

Programs with significant exploration expenditures and/or significant known results, and properties whose location is of particular strategic or geologic interest are described below. Information included in this section is taken from assessment files in the Red Lake Resident Geologist's office, unless otherwise indicated. Programs are keyed with numbers in parentheses to Table 5 and Figures 2, 3, 4 and 5.

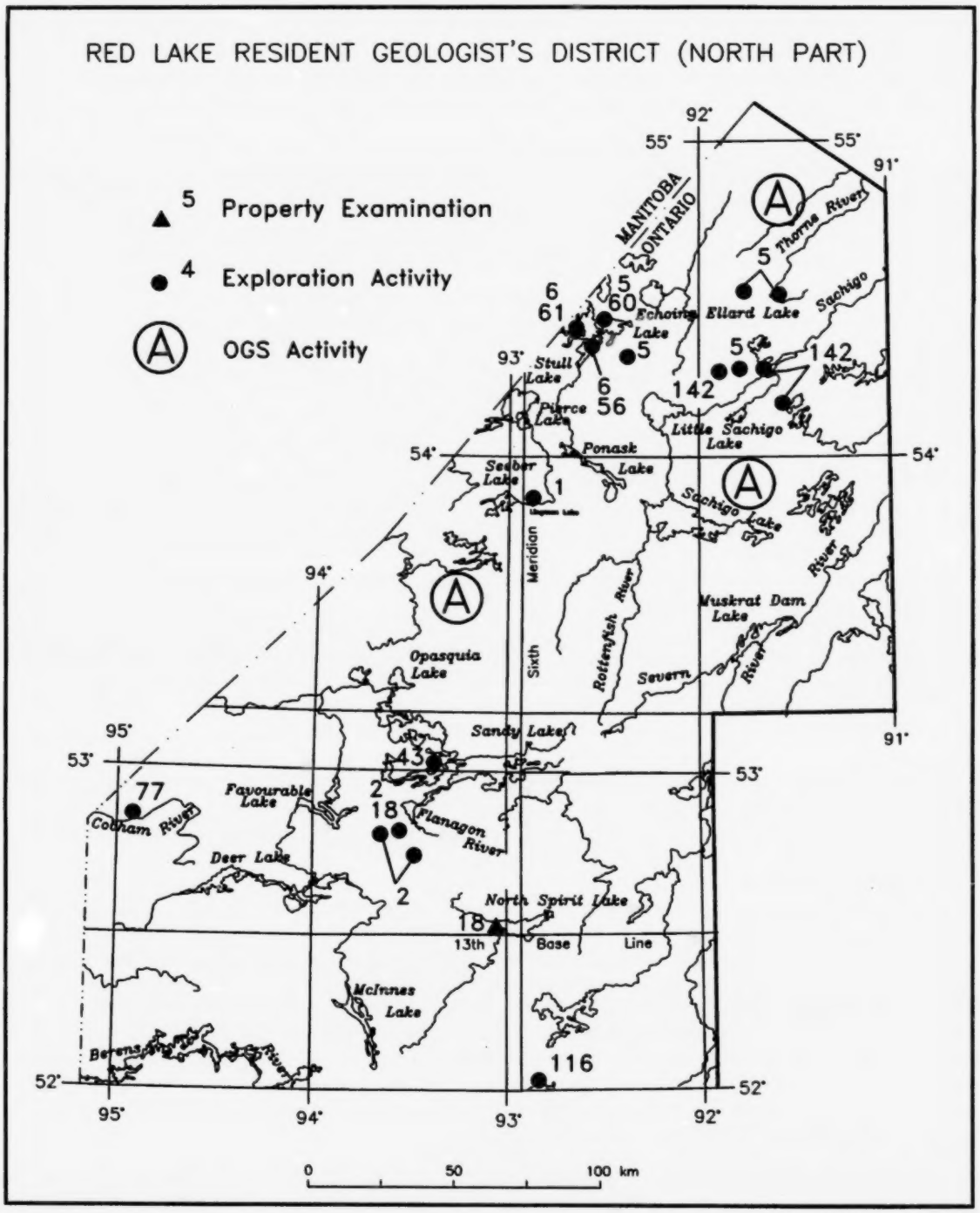

Figure 2. Red Lake District (north part): exploration, OGS activity and property examinations.

Table 4. Assessment files received in the Red Lake District in 2002.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
MMI ..... Mobile Metal Ion soil sampling survey
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Baird Township	Ansil Resources Ltd. (Baird Township Property)	2001	Pr, MMI, Samp, Assays	2.22764	(85-2002)
Baird and Heyson townships	Goldcorp Inc. (Parvus Property)	2001	MMI, Samp, Lc, Assays	2.23820	(1096-2002)
Ball Township	English, P.	2002	Pr	2.23762	(1036-2002)
Ball Township	Redstar Gold Corp (Pipestone North Property)	2002	GL, Pr, Samp, Assays	2.23952	(1224-2002)
Ball Township	Redstar Gold Corp (Pipestone South Property)	2002	GL, Samp, Assays	2.23951	(1223-2002)
Ball, Heyson, Killala and Todd townships; and Indian House and Faulkenham Lake areas	Redstar Gold Corp (West Red Lake Property)	2002	Technical Report		Non-Assessment
Ball Township and Indian House Lake Area	Rubicon Minerals Corporation (Pipestone South Property)	2001–2002	AMAG, Data Interpretation	2.22924	(226-2002)
Ball and Mulcahy townships	Goldcorp Inc. (Middle Bay and Pipestone Bay Properties)	2001	GL, Samp, GC, Assays	2.23827	(11-2002)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Ball and Mulcahy townships	Goldcorp Inc. (Trout Bay Property)	2000	GL, GC, Assays, Pr, Relogging core, DDH(6)–1861m	2.21430	(30134-2001)
Ball and Todd townships	Redstar Gold Corp. (Pipestone North Property)	2002	GL, Pr, Samp, Assays	2.24218	(1459-2002)
Ball and Todd townships and Indian House Lake Area	Rubicon Minerals Corporation (Pipestone North and South Blocks)	2001	AMAG	2.23511	(794-2002)
Balmer, Byshe, Ranger, and Willans townships	Goldcorp Inc. (Gullrock Property)	2001	Lc, MMI, Samp, DDH(9)–4555.3m, Assays, Re-logging Core	2.23576	(856-2002)
Balmer and Dome townships	Goldcorp Inc. (Marcus Property)	2002	IP, Lc	2.23569	(849-2002)
Bateman Township	Goldcorp Inc. (Beatrice Bay Property)	2002	IP	2.23515	(798-2002)
Bateman Township	Rubicon Minerals Corporation (McFinley Mine Property)	2002	Technical Report		Non-Assessment
Belanger Township and Fredart Lake Area	Tribute Minerals Inc. (Fredart Lake Property)	2001–2002	Lc, GM, MMI, Assays	2.23623	(900-2002)
Blackbear Lake Area	Sunridge Gold Corp. (East Bay Property)	2002	MMI, Samp, Assays	2.24515	(1737-2002)
Brownstone and Casummit lakes Area	Tribute Minerals Inc. (Richardson Lake Property)	2001	AMAG, AEM	2.22193	(39820-2001)
Brownstone and Casummit lakes Area	Tribute Minerals Inc. (Richardson Lake Property)	2001	Geological Interpretation of AMAG Data	2.23071	(369-2002)
Brownstone and Casummit lakes Area	Tribute Minerals Inc. (Richardson Lake Property)	2002	Structural and Litholigic Evaluation of AMAG Data	2.23519	(803-2002)
Bruce, Gerry, and South of Otter Lake areas	Goldcorp Inc./Tri Origin Exploration Ltd. (Confederation Project Area)	2001	Geophysical Processing and Interpretation of AMAG Data	2.22751	(77-2002)
Byshe Township	Dan Patrie Exploration Ltd. (Starrat Channal Property)	2002	IP, Lc	2.23252	(528-2002)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Casummit and Little Shabumeni Lake areas	Fronteer Development Group Inc. (Mink Property)	2001	Pr, GL, Rock and Soil Samp, GC, Assays	2.24295	(1536-2002)
Casummit, Keigat, Little Shabumeni, and Shabumeni Lake areas, and Dent Township	Fronteer Development Group Inc. (Birch Lake Project)	2001	GL, Pr, Samp, GC, Assays		Non-Assessment
Coli Lake Area	Planet Exploration Inc./Corsair Exploration Inc. (Sidace Lake Property)	2002	DDH(5)=1080m, Assays	2.23961	(1233-2002)
Coli Lake Area	Rubicon Minerals Corporation (Planet Project Basin Study)	2002	GM (Natural Source Audio-frequency Magnetotelluric (NSAMT), Lc	2.24439	(1667-2002)
Corless, Dent and Knott townships	Fronteer Development Group Inc.	2002	GM, Pr, Rock and Soil Samp, Assays	2.23797	(1071-2002)
Dent Township	Consolidated Abaddon Resources Inc. (Jackson–Manion North Gold Property)	2002	Technical Report		Non-Assessment
Dome Township	Consolidated Global Minerals Ltd. (Red Lake Property)	2002	GL, Pr, Samp, Assays	2.24004	(1266-2002)
Dome Township	Goldcorp Inc. (McKenzie Island Property)	2002	GL, Samp, Assays	2.23837	(1108-2002)
Dome Township	Goldcorp Inc. (Rahill Property)	2002	Lake Bottom Sediment Samp, Assays	2.23866	(1208-2002)
Dome Township	Goldcorp Inc. (Rahill Property)	2002	Lake Bottom Sediment Samp, Assays	2.23867	(1135-2002)
Dome Township	Goldcorp Inc. (Rahill Property)	2002	Lake Bottom Sediment Samp, Assays	2.23933	(1134-2002)
Dome Township	Outokumpu Mines Ltd. (Fisher Islands Project)	1990	DDH(7)=1211m, Assays, Photoplates of DDH		Non-Assessment
Dome Township	Placer Dome (CLA) Ltd. (McKenzie Island Property)	2002	Assays, Geology, Rock and Soil Samp, MMI	2.24023	(1282-2002)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Dome Township	Rubicon Minerals Corporation (Dorion–McCuaig Corridor)	2002	DDH(3)=1110m, Assays	2.24512	(1734-2002)
Dome Township	Rubicon Minerals Corporation (Red Lake Project)	2002	DDH(1)=321m, Assays	2.23236	(513-2002)
Dome Township	Sherritt Gordon Ltd. (Fisher Islands Project)	1988	GL, Tr, Samp, Lithogeochem, Assays		Non-Assessment (File 4)
Dome Township	Sherritt Gordon Ltd. (Fisher Islands Project)	1989	DDH(12)=1805m, GM, VLF-EM, Assays		Non-Assessment (Files 1 + 2)
Dome Township	Sherritt Gordon Ltd. (Fisher Islands Project)	1989	IP		Non-Assessment (File 3)
Dome and Fairlie townships	Cypress Development Corp. (English Option – McKenzie Island)	2002	Lc, GM, VLF-EM	2.23240	(516-2002)
Dome, Fairlie and Heyson townships	Cypress Development Corp. (McKenzie Gold Property)	2002	Property Evaluation		Non-Assessment
Dome, Graves, and McDonough townships	Rubicon Minerals Corporation (Slate Bay Property)	2001	AMAG	2.23015	(308-2002)
Dome and Heyson townships	Chevron Minerals Ltd. (Charlene Project)	1987-1988	Lc, GL, IP, GM, DD, Str, Assays, Grab and Channel Samp		Non-Assessment
Dome and McDonough townships	Rubicon Minerals Corporation (Dorion–McCuaig Corridor)	2001	Hydrographic Survey (Bathymetric and Acoustic Sub-Bottom)	2.23662	(937-2002)
Dome and McDonough townships	Rubicon Minerals Corporation (Dorion–McCuaig Corridor)	2002	DDH(3)=957m, Assays	2.23975	(1243-2002)
Dome and McDonough townships	Rubicon Minerals Corporation /AngloGold (Canada) Exploration (Post Narrows Block Property)	2002	AMAG	2.24128	(1377-2002)
Ear Falls, Karas Lake, Maskerine Lake, and Slate Lake areas	Graniz Mondal Inc. (Ear Falls Granite Project)	2001	Qualifying Report (Evaluation of Granite Quarrying and Finishing Plant Operations)		Non-Assessment

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Earngey Township	First Au Strategies Corp. (Uchi Lake Property)	2002	HLEM, MAG	2.23224	(504-2002)
Fairlie Township	Meunier, D. (St. Pauls Bay Property)	2002	Pr, Samp, Assays	2.23828, 2.23818	(1101-2002) (1094-2002)
Fairlie Township	Rubicon Minerals Corporation (Hammell Block Property)	2001	AMAG	2.23766	(1040-2002)
Fairlie Township	Rubicon Minerals Corporation (Humlin Property)	2002	DDH(2)=517m, Assays	2.24481	(1704-2002)
Fairlie Township	Rubicon Minerals Corporation (West Humlin Property)	2002	DDH(1)=306m, Assays	2.23332	(594-2002)
Fairlie, Killala, and Todd townships	Rubicon Minerals Corporation (Wolf Bay Block)	2001	AMAG	2.22408	(31074-2001)
Fredart Lake Area	Tribute Minerals Inc. (Fredart Lake Property)	2001	MMI, Assays	2.21556	(30263-2001)
Gerry Lake Area	Campbell, G.J. (Joy North Claim Property)	2002	MAG, VLF-EM	2.22820	(130-2002)
Gerry Lake Area	Campbell, G.J. (Joy North Claim Property)	2002	MMI, Samp, Assays	2.24393	(1622-2002)
Gerry Lake and South of Otter Lake areas	Goldcorp Inc. /Tri Origin Exploration Ltd. (Confederation JV Project)	2001	MMI	2.22752	(78-2002)
Heyson Township	Herbert, L.	2000	Str	2.23468	(751-2002)
Heyson Township	My-Ritt Red Lake Gold Mines Limited	1981, 1995	Property Evaluation		Non-Assessment
Heyson Township	Sunridge Gold Corp. (Heyson Property)	2002	Soil GC, MMI, Samp, Pr, Assays	2.23894	(1160-2002)
Karas Lake and South of Otter Lake areas	Tribute Minerals Inc. (Dixie Lake and Ben Lake Projects)	2002	Lc, IP, RES, GM (Titan-24 Array Tensor-Magnetotelluric)	2.24100	(1354-2002)
Knott and Mitchell townships	Red Lake Resources Inc. (Mitchell Dent Property)	2002	GL, Lc, AMAG	2.24353	(1583-2002)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Lingman Lake Area	Anaconda Gold Corp. (Lingman Lake Property)	2002	Property Evaluation		Non-Assessment
Little Bear Lake Area	Kafka, G.E. (Kafka Quartz Quarry)	2001	Str, Samp	2.23303	(570-2002)
McDonough Township	Rubicon Minerals Corporation (Slate Bay Property)	2001	DDH(6)=1672m, Assays	2.22391	(31059-2001)
McDonough Township	Skyharbour Developments Ltd. (Tomato Lake Property)	2002	Lc, GM, VLF-EM	2.23299	(566-2002)
Pakeagama Lake Area	Houston Lake Mining Inc. (Pakeagama Lake Property)	2001	Str, Samp, Assays	2.23023	(317-2002)
Ranger Township	Ansil Resources Ltd. (Ranger Twp. Property)	2001	MMI	2.23217	(498-2002)
Setting Net Lake Area	Anaconda Gold Corporation (Borthwick Lake Property)	2002	Property Evaluation		Non-Assessment
Setting Net Lake Area	Wolfden Resources Inc. (Borthwick Lake Property)	2000	Assays, Pr, Samp	2.23246	(522-2002)
Sobeski Lake Area	Consolidated Abaddon Resources Inc. (Sidace Lake Property)	2002	Property Evaluation		Non-Assessment
South of Otter Lake Area	Goldcorp Inc. /Tri Origin Exploration Ltd. (Snake Falls Project)	2001	DDH(1)=440m, Assays	2.22821	(131-2002)
South of Otter Lake Area	Goldcorp Inc. /Tri Origin Exploration Ltd. (Snake Falls Project)	2002	DDH(1)=492.5m, Assays	2.23177	(464-2002)
Todd Township	Goldcorp Inc. (Rowan/Martin Bay Property)	2002	IP, Lc	2.23565	(846-2002)
Todd Township	Redstar Gold Corp. (Pipestone East Property)	2002	GL, Pr, Samp, Assays	2.23915	(1181-2002)
Todd Township	Redstar Gold Corp. (Pipestone East and Wolf Bay Prop.)	2002	GL, Pr, Samp	2.23913	(1179-2002)

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Todd Township	Redstar Gold Corp. (Wolf Bay Property)	2002	GL, Str, Samp, Assays	2.23971	(1240-2002)
Willans Township	Ansil Resources Ltd. (Willans Twp. Property)	2001	MMI, Assays	2.23197	(483-2002)

**Corresponds to Resident Geologist Office file designation*

Table 5. Exploration activity in the Red Lake Resident Geologist District in 2002.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
MMI ..... Mobile Metal Ion soil sampling survey
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Anaconda Gold Corp. /Wolfden Resources Inc. (Lingman Lake Property)	Lingman Lake Area (Au)	Technical Report (Non-Assessment)
2	Anaconda Gold Corp. /Wolfden Resources Inc. (Borthwick Property)	Setting Net Lake (Au)	Technical Report (Non-Assessment) GL, Samp, Str
3	Ansil Resources Ltd. (Ranger Lake Property)	Ranger Township (Au, Ag, Co, Ni)	Soil GC, VLF-EM
4	Ansil Resources Ltd. (Willans Block Property)	Willans Township (Au, Ag)	Soil GC
5	Aurora Platinum Corp. /Superior Diamonds Inc. (Area B Property)	Ellard Lake, Gilleran Lake, Gummer Lake, Lacey Creek, Matthews Lake, Rapson Bay, Stull Lake and Thorne Lake Areas (Diamond, Au, Ni, Cu, Cr, Ti)	Technical Report (Non-Assessment) AMAG, GC, Samp for Heavy Minerals, Staking

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
6	Bema Gold Corporation	Gilleran Lake, Rapson Bay, Richardson Arm of Stull Lake and Stull Lake areas	Staking
7	Botel, T.J.	Dome Township (Au)	Staking
8	Boyes, T.W.	McDonough Township (Au)	Staking
9	Buckner, J.	Dent Township and Slate Lake Area	Staking
10	Bullion Resources Ltd.	Brownstone Lake and Wavell Lake areas	Staking
11	Campbell, G.J. (Joy North Claim Property)	Gerry Lake Area (Cu, Zn, Pb, Cd, Au, Co, Ni, Pd, Ag)	GM, VLF-EM (2.22820, 130-2002) MMI, Samp, Assays (2.24393, 1622-2002)
12	Candor Ventures Corp. /Luxor Explorations Inc. (Slate Bay Property)	McDonough Township (Au, Cu, Ag)	Assays, DDH(4)=649.53m, GM, IP
13	Clark, J.G.	Sobeski Lake Area	Staking
14	Conquest Resources Ltd. /Energold Minerals Inc. (Red Lake Gold Project)	Balmer Township (Au, As)	Assessment file review, Lc, Soil Samp
15	Consolidated Abaddon Resources Inc. (Sidace Lake (Formerly Sobeski Lake) Property)	Sobeski Lake Area (Au, Cu Zn)	Technical Report (non-assessment)Pr
16	Consolidated Abaddon Resources Inc. /West Hawk Development Corp. (Jackson–Manion North Gold Property)	Dent Township (Au)	Technical Report (Non-Assessment) Till Samp, GL
17	Consolidated Global Minerals Ltd. /Aquiline Resources Inc. (Dome Township Property)	Dome Township (Au)	GL, Pr, Samp, Assays (2.24004, 1266-2002)
18	Cook, J.F.	Setting Net Lake Area	Staking
19	Dan Patrie Exploration Ltd. (Starrat Channal Property)	Byshe Township (Au)	IP, Lc (2.23252; 528-2002)
20	Dan Patrie Exploration Ltd.	Baird, Byshe, Dome, Heyson and Ranger townships (Au)	Staking
21	Davis, Y.M., Desmeules, M.J., and Jankowski, P.A.	Otter Lake Area	Staking
22	Desmeules, M.J.	South of Otter Lake Area	Staking
23	English, P.	Ball Township (Au)	Pr (2.23762; 1036-2002)
24	English, P.	Baird, Balmer, Byshe, Dent, Dome, Earngey, Heyson, Killala, McDonough , Mitchell, Mulcahy, Ranger, Skinner, Willans townships, Avis Lake, Black Bear Lake, Casummit Lake, Coli Lake, Curie Lake, Dixie Lake, Gerry Lake, Little Bear Lake, Medicine Stone Lake, Otter Lake, Shabu Lake, Shabumeni Lake, Sobeski Lake, South of Byshe & Willans, and Uchi Lake areas	Staking
25	Eveleigh, A.J.	Black Bear Lake Area	Staking

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
26	First Au Strategies Corp. (Birch Lake Project)	Casummit Lake and Keigat Lake areas (Au)	Staking
27	First Au Strategies Corp. (Leg Lake Property)	Earngey Township (Au, Pt, Pd)	HLEM, MAG (2.23224, 504-2002)
28	First Au Strategies Corp. /Wolfden Resources Inc. (Argosy Mine Property)	Casummit Lake Area (Au)	DDH(9)=1513m, Assays, Samp
29	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Balmer Property)	Corless, Dent, Knott, and Mitchell townships (Au)	Pr, Samp (Rock and Soil), Assays (2.23797; 1071-2002) Staking, AMAG, AEM, GL, Tr
30	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Found Lake Property)	Agnew and Honeywell township (Au)	Staking
31	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Hurley Prospect)	Goodall Township (Au)	Staking, Pr, GC, Airborne Geophysics
32	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Portage Property)	Goodall and Skinner townships, and Shabu Lake Area (Au)	AMAG, AEM, Assays, GC, GL, Pr, Soil and Channel (Rock) Samp, Staking, Tr
33	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Sandy Point Property)	Keigat Lake Area (Au)	AEM, AMAG, Assays, GC, GL,Pr, Rock, Channel and Soil Samp, Staking, Tr
34	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Shabu Property)	Shabu Lake Area (Au)	Staking
35	Fronteer Development Group Inc. /Placer Dome Inc. (Formerly AurionGold Limited) (Wabunk Property)	Birkett, Costello and Earngey townships (Au)	Staking
36	Goldcorp Inc. (Beatrice Bay Property)	Bateman Township (Au)	IP (2.23515, 798-2002)
37	Goldcorp Inc. (Cochenour–Willans Mine Property)	Dome Townships (Au)	DDH(132)=2480m, Crown Pillar thicknesses
38	Goldcorp Inc. (Marcus Property)	Balmer and Dome Townships (Au)	IP, Lc (2.23569, 849-2002)
39	Goldcorp Inc. (McKenzie Island Property)	Dome Township (Au)	GL, Samp, Assays (2.23837, 1108-2002)
40	Goldcorp Inc. (Rahill Property)	Dome Township (Au)	Lake Bottom Sediment Samp, Assays (2.23867, 1135-2002), (2.23866, 1134-2002), (2.23933, 1208-2002) Staking
41	Goldcorp Inc. (Rowan/Martin Bay Property)	Todd Township (Au)	IP, Lc (2.23565, 846-2002)

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
42	Goldcorp Inc. /Tri Origin Exploration Ltd. (Snake Falls Property)	South of Otter Lake Area (Au, Ag, Cu, Zn)	DDH(1)=492.5m, Assays (2.23177, 464-2002) DDH(2)=871.5m, GC, Geophysical survey
43	Goldeye Explorations Ltd. (Sandborn Bay of Sandy Lake Project)	Granite Bay of Sandy Lake Area (Zn, Cu, Ag, Au)	GL, Staking, Pr, Samp, Geophysical Survey
44	Green, J.A.	Killala Township (Au)	Staking
45	Huston, C.D.	Bateman, Dent, Dome, Earngey, Graves townships, Black Bear Lake and Uchi Lake areas	Staking
46	Jilbey Enterprises Ltd.	Corless, and Costello townships, Brownstone Lake, Hailstone Lake, Keigat Lake, Little Shabumeni Lake, Satterly Lake, Seagrave Lake, Shabumeni Lake, Uchi Lake, Wavell Lake, and Zionz Lake areas (Diamonds)	Staking
47	Jilbey Enterprises Ltd. (Blue Property)	Goodall and Dent Townships	Staking
48	Jilbey Enterprises Ltd. (Car Lake Prospect)	Skinner Township and Shabu Lake Area (Au, Diamonds)	Staking
49	Jilbey Enterprises Ltd. (Lark Prospect)	Skinner Township (Au, Diamonds)	Staking
50	Jilbey Enterprises Ltd. (Shabumeni Lake Prospect)	Shabu Lake Area (Au, Diamonds)	Staking
51	Jilbey Enterprises Ltd. /Gold Canyon Resources Inc. (Springpole Lake Property)	Casummit Lake Area (Au, Diamonds)	GL, Pr, MMI, Regional till sampling, analysis for indicator minerals
52	Jonpol Explorations Ltd. (Slate Lake Property)	Slate Lake Area	Lc, Pr, Samp, VLF-EM
53	Kafka Granite LLC (Corless Quartz Property)	Little Bear Lake and Knott Township (Dimensional Stone)	Quarried 1107 tonnes of quartz
54	Kehoe, M.P. and P.T.	Bluffy Lake and South of Byshe & Willans townships areas	Staking
55	King's Bay Gold Corp. /Solitaire Minerals Corp. (Garnet Lake Prospect)	Belanger and Bowerman townships and Little Bear Lake and Knott Township Area (Au, Cu)	Assays, GC, GL, GM, VLF-EM, DDH(15)=3000', Lc, Pr, Samp, Staking, Str
56	Kinross Gold Corporation /Wolfden Resources Inc. (Rapson Bay Property)	Rapson Bay and Stull Lake areas (Au)	Pr, Staking
57	Kinross Gold Corporation /Wolfden Resources Inc. (Newman–Heyson Property)	Heyson and Baird Townships (Au)	Assays, DD, Lc, GC (Au + As), GM
58	Kinross Gold Corporation /Wolfden Resources Inc. (Nova-Co Property)	Baird Township (Au)	Assays, DD, Lc, GC (Au + As), GM, Samp, Pr
59	Labine, B.M.	Casummit Lake and Keigat Lake areas	Staking
60	Lake Shore Gold Corp.	Rapson Bay Area	Assays, Pr, Rock and Till Samp, Staking

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
61	Mackay, D.	Stull Lake Area	Staking
62	Madalena Ventures Inc.	Coli Lake Area	Staking
63	Masuparia Gold Corporation /Red Lake Resources Inc. (Horseshoe Island Property)	Casummit Lake Area (Au)	Data Compilation
64	Masuparia Gold Corporation /Red Lake Resources Inc. (Springpole Property)	Casummit Lake Area (Au)	Data Compilation
65	Masuparia Gold Corporation /Red Lake Resources Inc. (Starrat Channal Property)	Byshe Township (Au)	Data Compilation
66	Meunier, D.	Dome Township (Au)	Staking
67	Meunier, D. (St. Pauls Bay Property)	Fairlie Township (Au)	Pr, Samp, Assays (2.23828; 1101-2002) Assays (2.3818; 1094-2002)
68	Melville, R.W.	Heyson Township (Au)	Staking
69	Mosquito Consolidated Gold Mines Ltd. /Pelangio Mines Inc. (Birch Lake Property)	Keigat Lake Area (Au)	Pr, Data Compilation and processing, Re-logging core, Assessment file research
70	Newmont Canada Ltd. /Wolfden Resources Inc. (Skinner Gold Property)	Skinner Township (Au)	Staking
71	Pacific Ridge Exploration Ltd. /Western Prospector Group Ltd. (Wolf Bay Property)	Todd Township (Au)	Pr, Samp, Assessment file research
72	Pye, K.W.	Dome Township (Au)	Staking
73	Placer Dome (CLA) Ltd. (McKenzie Island Property)	Dome Township (Au, Co, Ni, Pd, Ag)	Assays, GL, Rock and Soil Samp, MMI (2.24023, 1282-2002)
74	Placer Dome North America /Claude Resources Inc. (Madsen Mine Property)	Baird Township (Au)	DDH(17)=10 641m, GC, GL, Rock and Soil Samp
75	Planet Exploration Inc. /Corsair Exploration Inc. (Sidace Lake Property)	Coli Lake Area (Au, Pt, Pd, Rh)	DDH(5)=1080m, Assays (2.23961; 1233-2002) DDH(4)=1000m
76	Quedent, O.	Gould Lake Area	Staking
77	Rae, B.	North of Palsen Lake Area	Staking
78	Red Lake Resources Inc. /Grande Portage Resources Ltd. (Mitchell Dent Property)	Knott and Mitchell townships (Au)	GL, Lc, AMAG (2.24353, 1583-2002) Pr, Soil Samp
79	Red Lake Resources Inc. /Fronteer Development Group Inc. (Grace Lake Property)	Shabumeni Lake Area and McNaughton Township (Au, Cu)	AMAG, AEM, Soil GC, GL, Rock and Channel Samp
80	Red Lake Resources Inc. /Fronteer Development Group Inc. (Mink Lake Property)	Casummit Lake and Little Shabumeni Lake areas (Au)	AMAG, AEM, Assays, Soil GC, GL, Rock and Channel Samp, Staking

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
81	Red Lake Resources Inc. /Fronteer Development Group Inc. (Sol D'Or Gold Mine Property)	Shabumeni Lake Area and McNaughton Township (Au, Ag)	AMAG, AEM, Assays, Soil GC, GL, Rock and Channel Samp
82	Red Lake Resources Inc. /Fronteer Development Group Inc. (Swain East Property)	Shabumeni Lake Area (Au, Cu)	AMAG, AEM, Assays, Soil GC, GL, Pr, Rock and Channel Samp, Staking
83	Redstar Gold Corp. /Rubicon Minerals Corporation (Newman–Todd Property)	Todd Township (Au)	AEM, AMAG
84	Redstar Gold Corp. /Rubicon Minerals Corporation (West Red Lake Property – Baird Property)	Heyson Township and Faulkenham Lake Area (Au)	Technical Report (Non-Assess) Str
85	Redstar Gold Corp. /Rubicon Minerals Corporation (West Red Lake Property – Pipestone East Property)	Ball and Todd townships (Au)	GL, Pr, Samp, Assays (2.23915, 1181-2002) AMAG
86	Redstar Gold Corp. /Rubicon Minerals Corporation (West Red Lake Property – Pipestone North Property)	Ball and Todd townships (Au)	Technical Report (Non-Assess) GL, Pr, Assays, Samp (2.24218, 1459-2002) GL, Pr, Samp, Assays (2.23952, 1224-2002)
87	Redstar Gold Corp. /Rubicon Minerals Corporation (West Red Lake Property – Pipestone South Property)	Ball Township and Indian House Lake Area (Au)	Technical Report (Non-Assess) Pr, Samp, GL (2.23913, 1179-2002) GL, Samp, Assays (2.23951, 1223-2002) Tr, Structural Mapping, Pr
88	Redstar Gold Corp. /Rubicon Minerals Corporation (West Red Lake Property – Wolf Bay Property)	Todd and Killala townships (Au)	Technical Report (Non-Assess) GL, Str, Samp, Assays (2.23971, 1240-2002) Pr, Samp, GL (2.23913, 1179-2002)
89	Renaissance Mining Corp. (Killala Property)	Killala Township (Au)	Assessment file research
90	Renaissance Mining Corp. (Laird Lake Property)	Killala Township and Medicine Stone Lake Area (Au)	Assessment file research
91	Renaissance Mining Corp. /Red Lake Resources Inc. (Corallen (Pure Gold) Property)	McDonough Township (Au)	Assessment file research
92	Renaissance Mining Corp. /Red Lake Resources Inc. (Dixie Lake North Property)	Dixie Lake Area(Au)	Assessment file research
93	Renaissance Mining Corp. /Red Lake Resources Inc. (Papaonga Lake Property)	Avis Lake Area (Au)	Assessment file research
94	Renaissance Mining Corp. /Red Lake Resources Inc. (Slate Lake Property)	Slate Lake Area (Au)	Assessment file research
95	Renaissance Mining Corp. /Red Lake Resources Inc. (Sobel Lake Property)	Otter Lake Area (Au)	Assessment file research
96	Renaissance Mining Corp. /Red Lake Resources Inc. (Wasp Property)	Earngey Township (Au)	Assessment file research

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
97	Rivard, D.	Casummit Lake and Keigat Lake areas	Staking
98	Rubicon Minerals Corporation	Corless Township (Au)	Staking
99	Rubicon Minerals Corporation (East Bay Property)	Bateman Township (Au)	Staking
100	Rubicon Minerals Corporation (McFinley Mine Property)	Bateman Township (Au)	Technical Report (Non-Assessment) DDH(14)=6263', GL, Str, Tr, Samp, Core retrieval, data compilation , GL, surface and underground interpretation, Airborne Geophysical Survey
101	Rubicon Minerals Corporation (Pipestone South Property)	Ball Township and Indian House Lake Area (Au)	AMAG, Data Interpretation (2.22924, 226-2002)
102	Rubicon Minerals Corporation (West Humlin Property)	Fairlie Township (Au)	DDH(1)=306m, Assays (2.23332, 594-2002)
103	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Adams Lake Property)	Balmer Township (Au)	GM (Natural Source Audio-frequency Magnetotelluric (NSAMT), Lc (Mentioned in Assess File 2.24439 (1667-2002)), Staking, GL, Airborne Geophysical Surveys
104	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Advance Red Lake JV Property)	Todd Township (Au)	Airborne and Ground Geophysical Surveys
105	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Dorion–McCuaig Corridor)	Dome and McDonough township (Au, As, Cr, Sb)	DDH(3)=957m, Assays (2.23975, 1234-2002) DDH(3)=1110m, Assays (2.24512, 1734-2002) DDH(1)=321m, Assays (2.23236, 513-2002) DDH(2)=542m, Assays, IP
106	Rubicon Minerals Corporation /AngloGold (Canada) Exploration (Humlin Property)	McDonough Township (Au)	DDH(2)=517m, Assays (2.24481, 1704-2002)
107	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Post Narrows Block Property)	McDonough Township (Au)	AMAG (2.24128, 1377-2002) DD
108	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Rivard Gold (Heath Property) Project)	Todd Township (Au)	GL, Ground and airborne geophysical surveys, Str, Tr, Samp, DDH(?)=1000'
109	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Planet Project Basin Study)	Coli Lake Area (Au)	GM (Natural Source Audio-frequency Magnetotelluric (NSAMT), Lc (2.24439, 1667-2002)
110	Rubicon Minerals Corporation /AngloGold (Canada) Exploration Ltd. (Slate Bay Property)	McDonough Township (Au)	Rock Samp, Airborne Geophysical Survey
111	Rubicon Minerals Corporation /Golden Tag Resources Ltd. (McCuaig Gold Project)	Dome Township (Au)	DDH(8)=2600m, GM, GL, Str, DDH(14)=3107m, Assays
112	Rupert Resources Ltd. (New Property near Gullrock Property)	Ranger and Willans Townships (Au)	Assessment file research
113	Rupert Resources Ltd. (Gullrock Property)	Ranger and Willans Townships (Au)	Assessment file research

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
114	Ruza, J.	Agnew, Bateman, Corless, Dent, Shaver, and Skinner townships, and Shabu Lake Area	Staking
115	Salo, L.	Keigat Lake Area	Staking
116	Shakakeesic, L.J., M., N.J., and P.	BMA 518924 and BMA 521924 areas	Staking
117	Skyharbour Resources Ltd. (Black Bear North and South Properties)	Bateman Township and Black Bear Lake Area (Au)	Pr, Rock Samp, Staking, Str
118	Skyharbour Resources Ltd. (Slate Bay Property)	Fairlie and Graves townships (Au, Pt, Pd)	Soil GC, Pr, Rock Samp, GL, DD, MMI, Str
119	Skyharbour Resources Ltd. (Surprise Lake Property)	Dent Township (Au)	Str, Pr, Samp
120	Skyharbour Resources Ltd. (Tomato Lake Property)	McDonough Township (Au)	Lc, GM, VLF-EM (2.23299, 566-2002) Till Samp, GC, Pr, Rock Samp, Str
121	Skyharbour Resources Ltd. (Uchi Property)	Dent, Agnew, and Earngey townships	Pr, Rock Samp
122	Skyharbour Resources Ltd. /Bayfield Ventures Corp. (Baird Property)	Baird Township (Au)	Soil GC, Pr, Rock Samp, GL, DDH(8)=5202' (1586m), Assays
123	Skyharbour Resources Ltd. /Cypress Development Corp. /Orko Gold Corporation (McKenzie Island Property)	Dome, Fairlie and Heyson townships (Au)	Lc, GM, VLF-EM (2.23240, 516-2002) MMI, Staking, Pr, Till samp, Rock Samp
124	Skyharbour Resources Ltd. /ITL Capital Corp. (Heyson Property)	Heyson and Byshe Township (Au)	GL, Pr, Tr,Till Samp, DD, MMI, Rock Samp
125	Southern Star Resources Inc. /Exall Resources Ltd. (Gold Eagle Mine Property)	Dome Township (Au)	Technical Report (Non-assessment) Data Compilation, Site rehab
126	Strilchuk, G.	Casummit Lake Area	Staking
127	Strilchuk, G.	Skinner Township	Staking
128	Sunridge Gold Corp. (Byshe and Heyson Townships Properties)	Byshe and Heyson townships (Au)	Soil GC, MMI, Samp, Pr, Assays (2.23894, 1160-2002) Technical Report (Non-assessment)
129	Sunridge Gold Corp. (Dixie Lake Property)	Dixie Lake Area (Au)	Technical Report (Non-assessment) Assays, GL, Str
130	Sunridge Gold Corp. (East Bay Property)	Bateman Township (Au)	MMI (2.24515, 1737-2002)
131	Sunridge Gold Corp. (Maskootch Property)	Avis Lake Area (Au, BM)	Technical Report (Non-assessment)
132	Sunridge Gold Corp. (McIntyre Mine Property)	Casummit Lake Area (Au)	Technical Report (Non-assessment)
133	Sunridge Gold Corp. (Northgate Property)	Uchi Lake Area and Earngey Township (Au)	Technical Report (Non-assessment)

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
134	Teck Cominco Ltd.	Honeywell Township	Staking
135	Tri Origin Exploration Ltd.	South of Otter Lake Area	Staking
136	Tribute Minerals Inc. (Bridget Lake Gold Property)	Ball Township (Au)	DDH(7)=939m, Assays
137	Tribute Minerals Inc. (Fredart Lake Property)	Fredart Lake Area and Belanger Township (BM)	Lc, GM (2.23623, 900-2002) Staking
138	Tribute Minerals Inc. /Continuum Resources Ltd. (Richardson Lake Property)	Brownstone and Casummit lakes Area (Au)	Structural and Litholigic Evaluation of AMAG Data (2.23519; 803-2002) Re-logged core
139	Tribute Minerals Inc. /Noranda Inc. (Ben Lake Property)	Karas Lake Area (Cu, Zn, Au)	GM (Titan-24 Array Tensor-Magnetotelluric) (2.24100, 1354-2002)
140	Tribute Minerals Inc. /Noranda Inc. (CopperLode D Property)	Belanger Township (Cu, Zn, Au)	DDH(2)=400m
141	Tribute Minerals Inc. /Noranda Inc. (Dixie 17, 18 and 19 Properties)	Gerry Lake and South of Otter Lake areas (Cu, Zn, Au)	Lc, IP, RES, GM (Titan-24 Array Tensor-Magnetotelluric) (2.24100, 1354-2002) DDH(4)=1970m, Staking, Assays, PEM, GM
142	Wallbridge Mining Company Ltd.	Francois Lake, Hanson River, Matthews Lake and Winters Lake areas (Cu, Ni, PGE)	Staking
143	Watt, H.A. (Root Lake Property)	Root Lake Area (Rare Earth Metals)	Tr, Str, Pr, Samp
144	Williamson, J. (Slate Lake Property)	Slate Lake Area	Staking
145	Wolfden Resources Inc. /Explorers Alliance Corporation (My–Ritt Property)	Heyson Township (Au)	Assessment file research, Lc, GM, GC, Samp, Pr
146	Wolfden Resources Inc. (Redaurum Property)	Baird Township(Au)	Lc
147	Wolfden Resources Inc. (Whitehorse Island Property)	Dome Township (Au)	Assessment file research

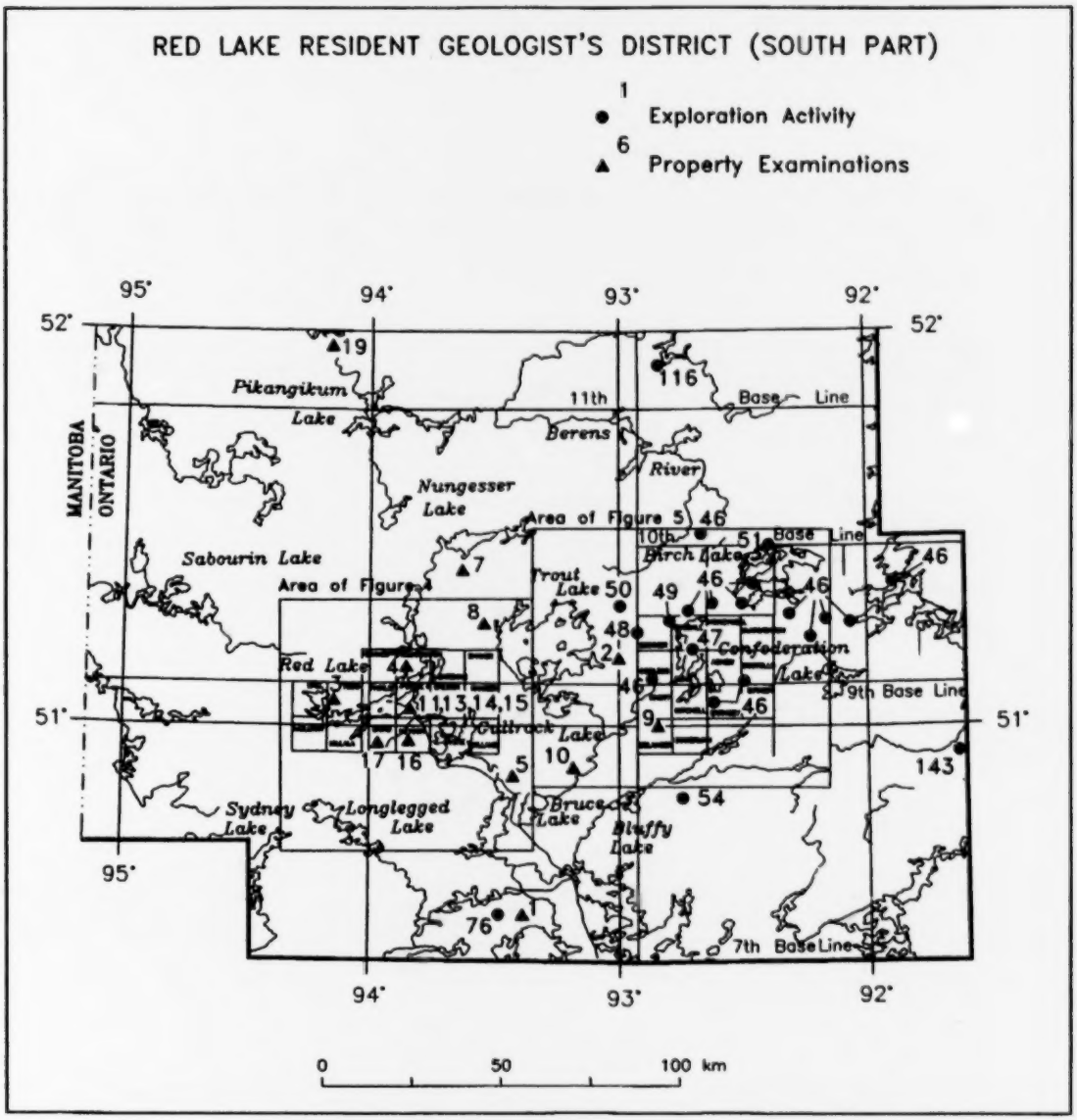

Figure 3. Red Lake District (south part): exploration and property examinations.

Red Lake Greenstone Belt

On-going collaborative research programs by the OGS and GSC, in conjunction with the Western Superior NATMAP program, have led to a reassessment of the genesis of the >1 million ounce gold deposits of the Red Lake greenstone belt. Approximately 70% of gold produced in the belt has come from one deposit, the Campbell–Red Lake orebody (Table 6). When production from the Cochenour–Willans mine, located approximately 5 km to the northwest, is included, then fully 78% of gold production has come from disseminated sulphide zones and siliceous replacement orebodies. The Madsen, a high-temperature disseminated-replacement style deposit, also ranks as a significant >2 million ounce gold producer in the belt. Classical vein-hosted, lode gold deposits account for only 10% of beltwide production.

Table 6. Red Lake greenstone belt gold production and grades versus ore type.

MINE	MINERALIZATION	GOLD PRODUCED	
		TROY OUNCES	OUNCES PER TON
CAMPBELL	Disseminated sulphide zones and structurally controlled siliceous replacement zones in Fe-carb veined & altered basalt	10,157,109	0.581
RED LAKE	Disseminated sulphide zones and structurally controlled siliceous replacement zones in Fe-carb veined & altered basalt	3,233,319	0.386
MADSEN	High-temperature disseminated-replacement-style in altered basalt	2,452,388	0.289
COCHENOUR–WILLANS	Siliceous replacement zones in Fe-carb veins, pods & altered basalt	1,244,279	0.538
McKENZIE RED LAKE	Qv in shear at granodiorite/diorite contact (McKenzie Stock)	651,156	0.277
HOWEY	Qv in tension fractures in Qtz-porphyry dike	421,592	0.091
HASAGA	Qv in tension fractures in Qtz-porphyry dike	218,213	0.144
STARRATT OLSEN	Disseminated-replacement-style in altered basaltic rocks	163,990	0.181
H.G. YOUNG	Qtz & qtz-carb veins in altered basalt	55,244	0.192
McMARMAC	Siliceous zones in massive carbonate pods and lenses	45,246	0.296
GOLD EAGLE	Qv in shear near granodiorite/diorite/sed contact (McKenzie Stock)	40,204	0.223
GOLD SHORE	Qtz lenses at junction of conjugate shears in Dome Stock	21,100	0.244
BUFFALO	Qv with tourmaline and sulphides in conjugate shears in Dome Stock	1,656	0.052
ABINO	Qtz-sulphide veins in granodiorite	1,397	0.511
LAKE ROWAN	Qtz-sulphide veins in altered mafic rocks	1,298	0.100
RED SUMMIT	Qtz-sulphide veins in local shear zone	277	0.469
MOUNT JAMIE	Qtz-sulphide vein in altered basalt	265	0.480
McFINLEY	Qtz-sulphide veins and replacements of mafic, ultramafic rocks and IF	N/A	N/A

Legend: Fe-carb: iron-carbonate Qv: quartz vein Qtz: quartz qtz-carb: quartz and carbonate IF: iron formation

Recent publications (Dubé, Williamson and Malo 2002, 2001a, 2001b; Twomey and McGibbon 2001) have underlined the importance of carbonate veining, potassic metasomatism and polyphase deformation in the genesis of the highly auriferous, silicic replacement orebodies (High Grade Zone) at the Red Lake Mine. This model is now being extensively used by explorationists in the Red Lake belt. Indeed, the model is also being applied to other belts exhibiting the requisite geological relationships, such as portions of the Birch–Uchi and Confederation greenstone belts and the Sandy Lake belt.

A regional synthesis of alteration and gold mineralization in the Red Lake belt (Parker 2000) has indicated that areas exhibiting strong ferroan-dolomite ('Fe-carbonate') alteration and veining, and concomitant intense potassic metasomatism are prime areas of gold deposition. The 3 areas identified by Parker (2000) also host a significantly large proportion of gold occurrences and prospects; the Campbell–Red Lake and Cochenour–Willans orebodies are located in one of these domains in the eastern portion of the greenstone belt. Placer Dome (CLA) Ltd., Goldcorp Inc., Rubicon Minerals Corp. and a number of junior companies are aggressively pursuing targets in this area.

Active exploration, by a number of companies described below, is being undertaken in the other 2 areas exhibiting proximal alteration: in Heyson and Baird townships in the central portion of the greenstone belt; and in the Pipestone Bay area in the west end of the belt.

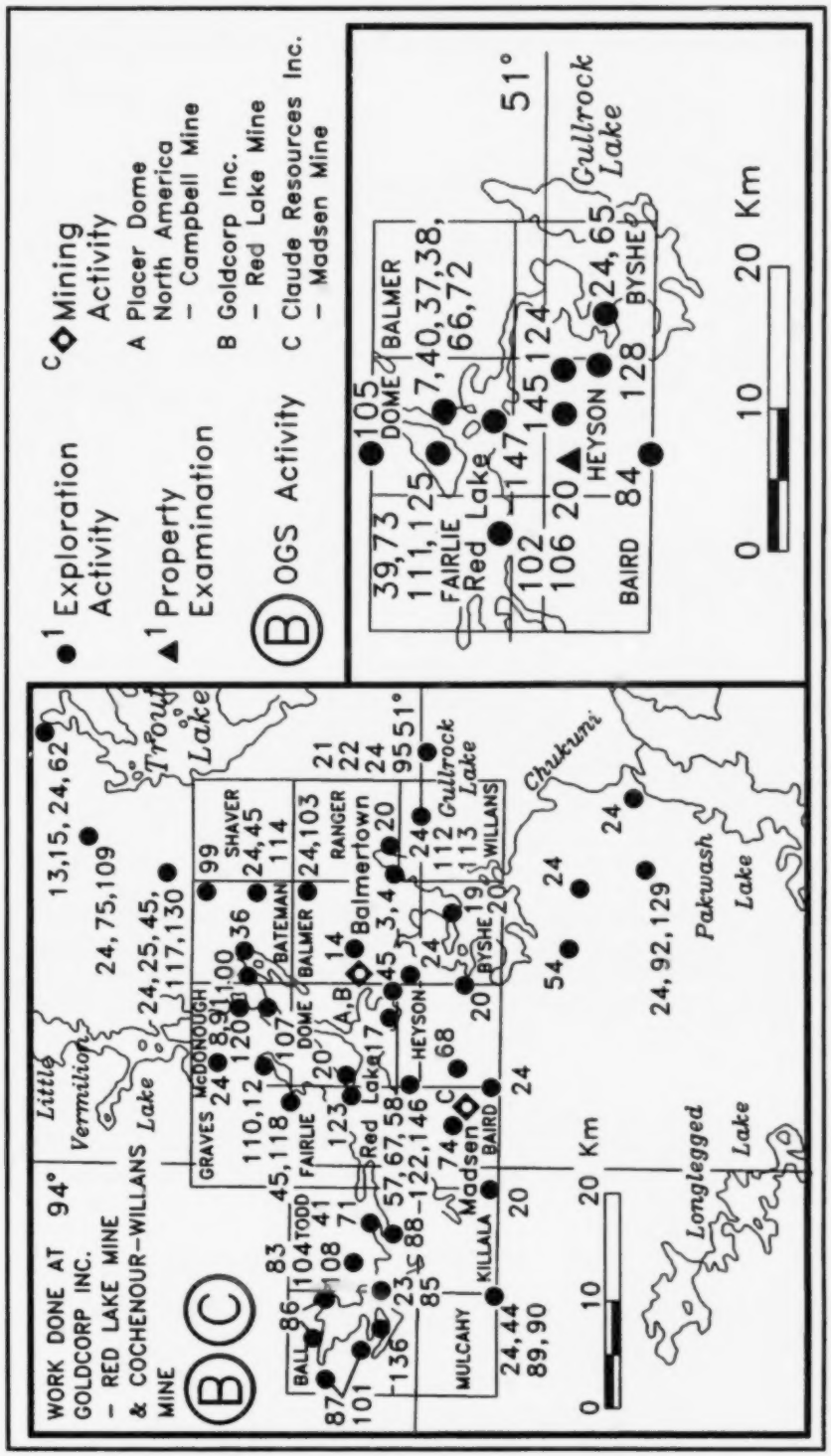

Figure 4. Red Lake greenstone belt: exploration, OGS activity and property examinations.

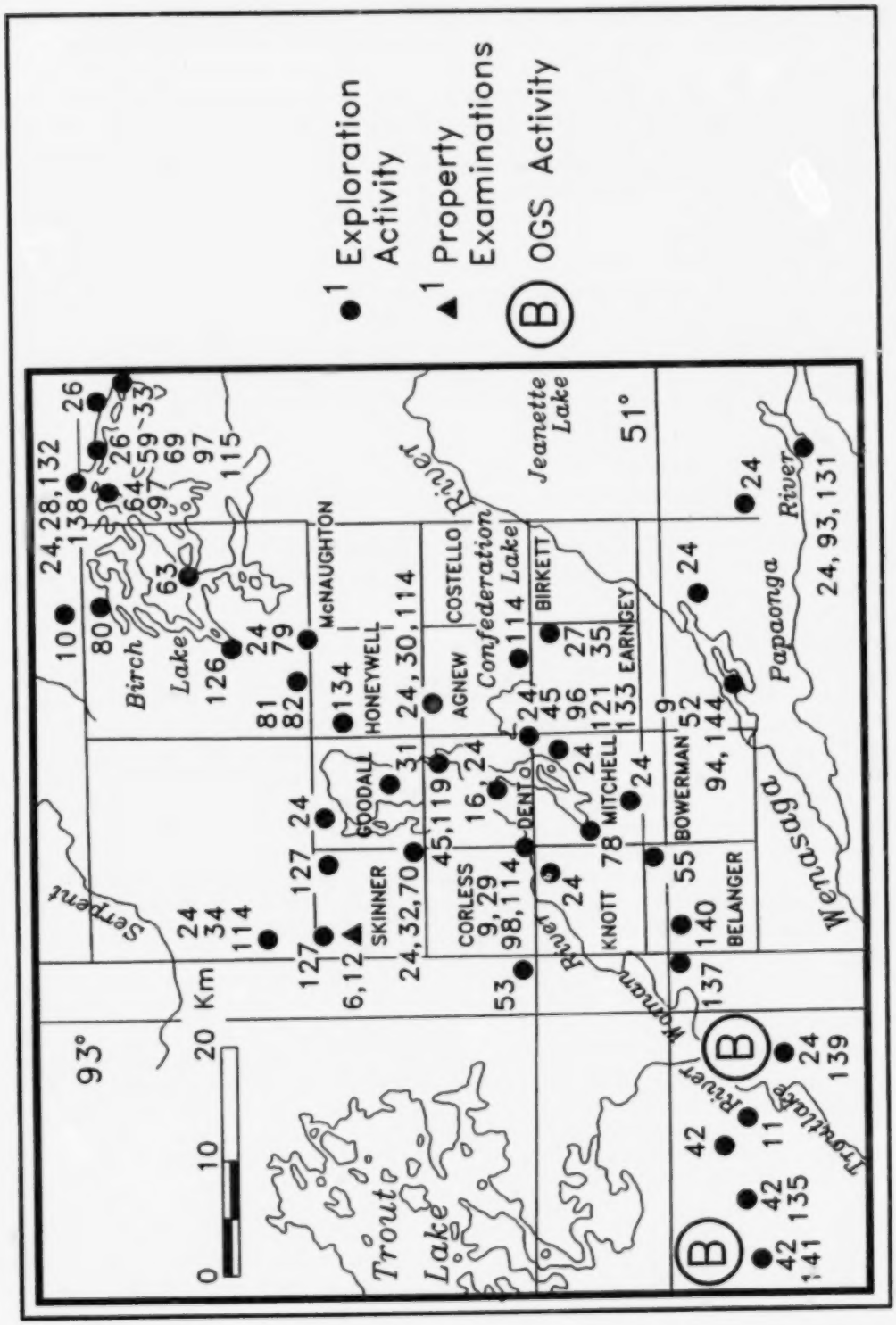

Figure 5. Birch–Uchi–Confederation greenstone belt: exploration, OGS activity and property examinations.

CANDORE VENTURES CORP.

The company is earning a 75% interest in Luxor Exploration Inc.'s Slate Bay property, comprising 8 patented mining claims in McDonough Township. Subsequent to the company's ground magnetic and IP surveys, a four-hole, 650 m, drill program was completed this year.

Intense magnetite, actinolite, chlorite, epidote and garnet altered sedimentary rock of the Breccia Zone hosts locally semi-massive pyrite and lesser pyrrhotite, chalcopyrite and tetrahedrite, with drill core assays from previous drilling as high as 1.8% Cu and 130.28 g/t Ag over 23.77 m. The current campaign intersected a chalcopyrite-pyrrhotite mineralized volcanic breccia that averaged 2.42% Cu, 0.68 g/t Au and 90.80 g/t Ag over 2.68 m in hole SB-02-1. This hole was drilled within an IP anomaly that extends for a distance of over 500 m and varies in width from 20 to 100 m. The mineralization is interpreted to have similarities with Fe-oxide Cu-Au (IOCG) deposits. The company plans to extend its geophysical coverage on the property and initiate further drilling in 2003.

GOLDCORP INC.

Significant drill programs were undertaken on several properties forming part of the company's extensive landholdings in the Red Lake camp. Diamond drilling (19 drill holes and wedge-offs, totalling 7497 m) and MMI sampling (approximately 100 samples) targeted Campbell–Red Lake style gold mineralization on the Marcus property in central Red Lake, adjacent to the past-producing Cochenour–Willans mine (1.2 million ounces gold produced between 1939 and 1971). Gold mineralization hosted in sulphidized iron formation that has undergone brittle deformation (as encountered at Rubicon's McFinley Mine project, 7 km to the northeast) is also a potential target at Cochenour. Two drill holes (>1000 m each) were started at year-end on the Cochenour property.

Additional MMI sampling (totaling approximately 1100 samples) was completed on the Wilmar, Redcon, Slate Bay and Marboy properties and on the Red Lake Mine site. IP surveys were performed on the Marcus, Wilmar and parts of the Rowan properties. Detailed structural work was undertaken by SRK Consulting on the Chevron property; on the adjacent Marcus property, detailed mapping and channel sampling was completed by Goldcorp personnel.

Quantec Geosciences Inc., funded in part through the Ontario Government's OMET ("Ontario Mineral Exploration Technologies") Program, performed a demonstration TITAN-24 survey over portions of the Marcus property and on the Red Lake Mine site; additional TITAN-24 surveying on the property was funded by Goldcorp.

Three drill holes (totalling 1364 m) were completed in 2002 on the Tri Origin joint venture property, 35 km southeast of Red Lake. Detail and in-fill MMI sampling (approximately 1000 samples) was also undertaken. Additional staking during 2002 enlarged the property considerably.

At the wholly owned past-producing Cochenour–Willans mine, 132 geotechnical holes were drilled (totalling 2480 m) to determine crown pillar thickness in 7 areas of the property. This work is Phase I of a formal closure plan being formulated by Goldcorp.

PLACER DOME (CLA) LTD.

In addition to its on-going exploration on the Campbell Mine property, Placer Dome is involved with exploring its McKenzie Island property in Dome Township and the Madsen Mine joint venture with Claude Resources Inc.

- **McKenzie Island Property:** This property has been explored by Placer Dome since 1994. Work in 2002 consisted of chip sampling and soil and MMI sampling, of several old trenches at the east side of the property. Results confirmed the presence of anomalous gold.

- **Madsen joint venture:** Work continued with an airborne geophysical survey and phase III and IV diamond drilling. The exploration budget for this phase of the project is a total of $1.2 million. Surface drilling on the Madsen has intersected pyrite-pyrrhotite-gold mineralization within a wide quartz-iron-carbonate-tourmaline

vein system, approximately 1.5 km north of the past producing Madsen gold mine. The mineralized system is approximately 300 m wide and has been observed over a minimum length of approximately 1 km; spacing of diamond drill holes within the zone was between 200 and 300 m, to a vertical depth of approximately 400 m. All the holes intersected a wide quartz-Fe-carbonate vein system hosted in metabasalts above the structural contact with a thick komatiite unit. Significant mineralization was recorded in multiple locations with visible gold observed in three holes. Twenty-one samples from the first seven holes returned gold values from 0.06 to 2.60 ounce per ton gold in 15 separate intervals (Claude Resources, News Release, September 3, 2002).

REDSTAR GOLD CORP.

Redstar Gold Corp. has 6 properties in the Red Lake District, all located in the western part of the Red Lake greenstone belt. Five of these are under option from Rubicon Minerals Corporation (Pipestone South, Pipestone North, Pipestone East, Wolf Bay, Baird), the sixth (Newman–Todd) is optioned from Newmont Canada Ltd.

The **Newman–Todd property** lies within a 2 km area of influence (i.e., is adjacent to a property under option from Rubicon) and is subject to the terms of the option agreement with Rubicon Minerals. Initial exploration work consisted of geological mapping, prospecting, hand stripping and sampling. Several new gold showings were discovered on the Pipestone properties. Anomalous gold was found in samples from all 6 properties. Further exploration work is intended on all 6 properties.

RUBICON MINERALS CORPORATION

Rubicon Minerals Corporation controls over 250 km^2 in the Red Lake gold camp. These holdings are subdivided into 4 major assets: the McFinley Gold Project (100% Rubicon), the Red Lake McCuaig Joint Venture Project (60% Rubicon and 40% Golden Tag Resources Ltd.), the Rubicon–AngloGold North America Inc. Option (RLJV) and the Redstar joint venture.

- **McFinley Gold Project:** The McFinley property has not been explored for the past several years due to legal problems between the previous owners and contractors involved with the construction of a test mill on the site. The McFinley property is located in Dome Township, on the East Bay deformation zone (home to several other active gold exploration properties). Exploration in the 1980s led to definition of an inferred resource of 334 007 tons grading 0.20 ounce per ton gold. The initial phase of exploration consisted of stripping, sampling and mapping and re-logging the old diamond drill core stored on the property. A new diamond drilling program totalled 1908.9 m of drilling in 14 shallow holes, all drill holes intersected gold mineralization. Significant results from this drilling include 21.26 ounces per ton gold over 1.15 feet in a new target zone that is open for additional follow up; 1.85 ounces per ton gold over 1.96 feet, 1.36 ounces per ton gold over 2.13 feet and 0.49 ounce per ton gold over 1.15 feet, also open for follow up. Additional work is planned for this project early in 2003.

- **Red Lake McCuaig Joint Venture Project:** The McCuaig property is located in Dome Township, on the Red Lake Mine Trend which hosts the currently producing Campbell and Red Lake mines plus the past producing Cochenour–Willans, McMarmac and McKenzie Red Lake mines. Rubicon completed 20 824 feet (6347 m) in 26 diamond drill holes on the project of which 13 holes (9599.74 feet; 2926 m) tested a gold-bearing structure first intersected in 2001. Highlights of the drill program include 2.21 ounces per ton gold over 2.30 feet (75.91 g/t over 0.70 m) in hole MC-02-32, part of an interval grading 0.67 ounce per ton gold over 10.17 feet (22.83 g/t over 3.10 m); 0.74 ounce per ton gold over 5.58 feet (25.48 g/t over 1.07 m) in Hole MC-02-27, plus a separate interval of 0.53 ounce per ton gold over 1.48 feet (18.08 g/t over 0.45 m). Gold mineralization, including visible gold noted in 11 holes, occurs within highly deformed and silicified ultramafic rocks associated with disseminated sulphide zones (pyrrhotite, magnetite, pyrite ± fine-grained arsenopyrite) and in quartz-carbonate (ankerite) veins. The gold-bearing zone occurs at the western part of the McCuaig project, close to the boundary with Rubicon claims currently under option to AngloGold North America Inc. Further diamond drilling is planned for the winter of 2003 (Rubicon Minerals, News Release, November 15, 2002).

- **Rubicon–AngloGold North America Inc. Option (RLJV):** The RLJV covers the largest portion of Rubicon's Red Lake land holdings. AngloGold can earn up to a 70% interest in the project by spending C$5.4 million before January 25, 2005. The joint venture comprises 8 separate properties (*see* Tables 4 and 5) with differing amounts of exploration on each one. The recently acquired Rivard gold property is part of the RLJV. Exploration activities on the RLJV properties include diamond drilling, ground and airborne geophysical surveys and surface stripping and sampling. Rubicon has completed 20 300 feet (6200 m) of drilling in 5 target areas of the RLJV property. Four of the targets are in the Dorion–McCuaig Corridor (altered and mineralized rocks that are interpreted to be the westward extension of the Red Lake Mine Trend) which also includes the contiguous McCuaig property. As well, new gold mineralization on the RLJV property has been intersected in 3 target areas (the B-, C- and E-Zones) in areas not previously known to contain gold. Three holes (4143 feet, 1263 m) were drilled at the B zone target. Drill hole B-03 intersected up to 0.30 ounce per ton gold over 1.97 feet (10.27 g/t gold over 0.6 m) in a quartz carbonate vein in mafic metavolcanic rocks. Visible gold was noted in the core. In the C-Zone area, located 700 m to the southwest of B-Zone, 4 drill holes (4400 feet, 1341 m) tested extensively quartz-carbonate veined intrusive rocks developed at the contact between altered ultramafic and basaltic rocks. Assays for this section returned 0.26 ounce per ton gold over 1.15 feet (8.83 g/t gold over 0.35 m - metallic fire assay). All of the veined-intrusive rock is anomalous in gold. In the E-Zone target area, 2 holes (1791 feet, 546 m) tested a major shear zone developed within mafic metavolcanic and metasedimentary rocks, approximately 900 m to the northeast of previous drilling in the Dorion Island Area. Both holes intersected gold-bearing sections with a maximum of 0.07 ounce per ton gold over 0.98 feet (2.38 g/t over 0.30 m) (Rubicon Minerals, News Release, May 2, 2002).

The Redstar joint venture properties are discussed under Redstar Gold Corp.

SKYHARBOUR RESOURCES LTD.

Skyharbour Resources Ltd. has 6 properties in the Red Lake belt.

- **Baird Property:** Skyharbour optioned the Baird Property from Bayfield Ventures Corp. Exploration work included detailed mapping of the property, relogging core from past drill programs, a mobile metal ion (MMI) survey and diamond drilling. An eight-hole (1586.7 m) diamond drill program was carried out in August of 2002. Gold values of up to 0.343 ounce per ton gold over 0.8 m were encountered within a quartz-carbonate breccia alteration system that correlates to significant MMI anomalies on surface.

- **Heyson Property:** Skyharbour has acquired an option to earn 51% of the Heyson Property from ITL Capital Corporation. The Heyson property lies in the southern portion of the central Red Lake gold belt, 5 km south of the Goldcorp Inc.'s Red Lake Mine. Exploration work included geological mapping, bedrock sampling, till sampling and a MMI survey.

- **Mackenzie Island Property:** Skyharbour has acquired an option to earn 51% of the Mackenzie Island Property from Cypress Development Corp. The Mackenzie Island Property lies adjacent to the Rubicon–AngloGold RLJV property in the central Red Lake belt. Exploration work included geological mapping, bedrock sampling, till sampling and a MMI survey.

- **Slate Bay Property:** The Slate Bay Property is 100% owned by Skyharbour, and adjoins Rubicon Minerals' McCuaig gold project in the northern Red Lake gold belt. Exploration work included prospecting, bedrock sampling, till sampling and a MMI survey.

- **Tomato Lake and Black Bear Properties:** The Tomato Lake and Black Bear Properties are 100% owned by Skyharbour and collectively encompass 5680 acres in the northeastern portion of the Red Lake greenstone belt. Only limited exploration work was carried out during 2002.

SOUTHERN STAR RESOURCES INC.

Southern Star Resources Inc. entered into an agreement with Exall Resources Limited to acquire a 50% interest in the Gold Eagle Mine property. The property comprises 35 patented claims (totaling approximately 726 hectares), covers parts of McKenzie Island, Dome Township, and encompasses the past-producing Gold Eagle Mine (produced 40 204 ounces of gold between 1937 and 1941). The geology and the state of the old mine workings were examined in October 2002 by representatives of Southern Star. A technical report on the property, prepared by Cargill Consulting Geologists Ltd., recommends further work on the property.

SUNRIDGE GOLD CORP.

Sunridge Gold Corp. formerly held 5 properties in the Red Lake belt, but dropped the option on all of them. Prior to dropping these options, they carried out MMI sampling, bedrock sampling and prospecting on their East Bay and Heyson Township properties. Consultants for the company carried out data compilation on the Dixie Lake, Heyson and Byshe properties in the Red Lake Belt.

TRIBUTE MINERALS INC.

Tribute Minerals Inc. holds 2 properties in the Red Lake belt.

- **Bridget Lake:** Tribute carried out a seven-hole, 939 m, diamond drill program on its Bridget Lake gold property in Ball Township. Anomalous gold values were intersected in all the holes. The highest assay returned was 5.1 g/t (0.149 ounce per ton gold) over one metre. The alteration and mineralization are coincident with north-northeast- and north-northwest-trending structural features intersecting chert-oxide iron formation and interbedded carbonates.

- **Confederation Lake:** Tribute optioned Noranda Inc.'s Confederation Lake properties comprising 9 claim blocks covering approximately 15 500 hectares along a 70 km strike length of highly prospective VMS Cu-Zn and gold exploration targets. A Quantec TITAN 24 - MT/IP Deep Earth Imaging System demonstration geophysical survey was conducted over the Dixie and Ben Lake properties (both part of the Noranda option). The Dixie property includes the 17, 18, and 19 zones. Previous exploration has identified the Dixie 18 zone as containing an inferred mineral resource of 110 000 tonnes of 0.50% Cu and 12.5% Zn. The TITAN 24 survey tested an area 1 by 2.5 km covering the Dixie 19 zone (1.5% Cu and 6.33% Zn over 3.35 m) and the eastern extensions of the Dixie 17 and Dixie 18 zones. The TITAN 24 system was developed by Quantec Geoscience Ltd., with funding in part from OMET (Ontario Mineral Exploration Technologies Program). The system is intended to detect potential mineralization to depths of 1000 m. The TITAN-24 generated data are integrated with historical and current geological data to produce computerized 2-D and 3-D geophysical models. The OMET program is designed to develop and test innovative mineral exploration technologies and methods that promise to enhance the efficiency of exploration in Ontario. A four-hole diamond drill program on the Dixie claim group tested the results of this survey. The drilling intersected disseminated to massive sphalerite (zinc mineralization) containing minor chalcopyrite (copper mineralization) from 334 m to 342 m down the hole. A high-grade section, of potential economic significance, was cut from 339 m to 340 m and averaged 12.09% Zn, including 21.53% Zn over a 0.5 m portion (Tribute Minerals, News Release, September 3, 2002).

WOLFDEN RESOURCES INC.

Wolfden Resources Inc. holds 5 properties in the Red Lake belt either completely or in joint venture.

- **Bonanza Property:** This Dome Township property covers favourable geology along the unconformity between the Balmer and Confederation assemblages. It contains the Sanshaw prospect that has limited underground development and is reported to host an inferred resource of 175 000 tons averaging 0.20 ounce per ton gold above the 375-foot level. The property covers a significant portion of Bruce Channel sedimentary rocks, similar

to those that host a new style of gold mineralization in the Red Lake area that has recently been discovered at Placer Dome's Campbell Mine, 5 km to the east.

- **Nova-Co** and **Newman–Heyson:** These 2 adjacent properties in Heyson and Baird townships are located in the heart of the Red Lake greenstone belt and host a large number of significant untested ultramafic rock units and associated fold noses. The properties are the subject of an option agreement with Kinross Gold Corporation, which can earn a 51% interest. An exploration program, including diamond drilling, started late in 2002. The first hole, RLK-02-01, intersected 2 significant gold-bearing zones. The first, from 225.8 to 226.75 m (0.95 m), returning 8.64 g/t Au (0.25 ounce per ton gold); the second, from 233.2 to 233.8 m (0.6 m) assayed 13.87 g/t Au (0.4 ounce per ton gold) (Wolfden Resources, News Release, December 13, 2002).

- **East Bay Gold Property:** Late in 2002, Wolfden signed a letter of intent with Placer Dome (CLA) Ltd., whereby Wolfden will have the right to earn an interest in the East Bay Gold Property, comprising 106 mining claim units (1696 hectares) in Bateman Township. Wolfden can earn a 50% interest in the property by spending $2 000 000 in exploration on the property over a three-year period and will be the operator during the earn-in stage. The exploration will be carried out under the technical supervision and guidance of Placer Dome.

Birch–Uchi and Confederation Greenstone Belts

Mesoarchean rocks are interpreted to lie in a semi-continuous arc along the southern margin of the Trout Lake batholith, forming the eastern continuation of the Red Lake belt, through the Confederation greenstone belt and north into the Birch–Uchi belt. Rogers (2002) has mapped Balmer- and Woman-age (from ca. 2.98 Ga to ca. 2.77 Ga, respectively), mafic to felsic volcanic and minor sedimentary rocks in the Woman Lake area, east of the Trout Lake batholith. These areas were the first to be explored for Red Lake style gold mineralization.

Four, small (<25 km^2) Temiskaming-like pull-apart basins were interpreted by Devaney (2001a, 2001b) to exist in the Birch Lake area, north of the Okanse Lake pluton. The Springpole Lake gold deposit (historical estimated resource of 27 million tons at 0.035 ounce gold per ton) owned by Gold Canyon Resources Inc., is believed to be genetically related to a high-level alkalic porphyry and breccia pipe complex (Barron 1996) situated on the flank of one of the interpreted basins. Fronteer Development Group Inc. and Red Lake Resources Inc. have investigated a number of gold occurrences adjacent to the southern flank of a basin situated in the Grace Lake and Sol D'Or mine areas (*see* "Fronteer Development Group" and "Red Lake Resources").

Thorpe (1993) found elevated gold grain counts in till in several parts of the Birch–Uchi belt. Geochemistry of fine till fractions and heavy mineral concentrates also yielded numerous samples with significantly elevated gold contents: results from some localities surpassing those taken in the Red Lake belt. This evidence, coupled with the presence of numerous gold occurrences and small, past-producers, and the similarity in age to rocks hosting gold in the Red Lake belt, have spurred on current exploration efforts by a number of companies.

The presence of deformed, auriferous iron formation in the Birch–Uchi has also led to exploration for deposits similar to Placer Dome Inc.'s Musselwhite Mine (*see* "First Au Strategies Corp.").

FIRST AU STRATEGIES CORP.

The company has one of the largest land positions in the Birch–Uchi greenstone belt, comprising 3 properties (totalling 539 claims, covering 9624 hectares) with significant gold and Cu-Ni-PGE potential.

- **Casummit Lake Property:** includes claims under option from Wolfden Resources Inc., which include the past-producing Argosy Mine (intermittently between 1934 and 1952, it produced 101 875 ounces of gold at an average grade of 0.37 ounce gold per ton). Gold production from the property came from quartz veins hosted by both metasediments and quartz porphyry. A drill campaign of nine holes (totalling 1513 m) successfully tested the extension of veins below the depth (275 m) of previous mining (*see* Wolfden Resources, below).

- **Birch Lake Property:** Totalling 217 claim units, the property is located 3 km east-southeast of the Argosy mine in the Casummit and Keigat lake areas. The property covers 14 km of strike length on a major, northwesterly trending deformation zone that is known to be associated with gold mineralization. Only limited exploration has been previously conducted on the Birch Lake claims, but scattered gold mineralization in iron formation has been intersected in several old drill holes. The company believes the regional geophysical signature on the Birch Lake property to be similar to that of Placer Dome's Musselwhite Mine, in the Thunder Bay North District, where more than 3 million ounces of gold are hosted by intensely deformed iron formation.

- **Leg Lake Intrusive Complex ("LLIC"):** is the third property (comprising 221 claims), which is underlain by a layered mafic–ultramafic complex in Earngey and Birkett townships. This 8 by 2 km elliptical intrusion has been the subject of previous drilling for Cu-Ni mineralization hosted in a known massive chalcopyrite-pyrrhotite occurrence. Values of >2% Cu have been reported, but previous workers did not analyze for platinum group elements. Recent grab samples, however, have returned up to 1 g/t PGE. Work in 2002 consisted of ground geophysical surveys, with follow-up work planned for early 2003.

FRONTEER DEVELOPMENT GROUP INC.

Fronteer is the premier landholder in the Birch–Uchi greenstone belt and controls over 23 000 hectares of prospective ground. All properties are optioned out to, and fully funded by, industry partners Placer Dome Inc. (through its acquisition of AurionGold Limited) and Red Lake Resources Inc. Fronteer managed and operated 3 exploration programs for a total exploration expenditure of approximately $750 000 in 2002 (of which approximately $500 000 was spent on the Placer Dome option, and $250 000 on the Red Lake Resources option). Work performed on the properties included a high-resolution airborne magnetic/electromagnetic survey (totalling 1076 line-kilometres at 75 m line-spacing and a clearance of 15 m).

Fronteer Development Group Inc.–Placer Dome Inc.

- **Balmer Property:** Channel sampling of the Cariboo Vein returned 2 high-grade gold sections grading an average of 14.8 g/t Au over 0.47 m and 20.8 g/t Au over 0.55 m. This vein is exposed intermittently along strike for 140 m and has an average width of 0.40 m. In particular, airborne magnetic data, along with soil geochemistry results have outlined a number of other structural zones parallel to the Cariboo Vein that are characterized by similar elevated levels of gold, arsenic, bismuth and tellurium in soils.

- **Sandy Point Property:** Detailed channel sampling was carried out on the main Sandy Point Showing and returned gold grades of up to 21.73 g/t over 1.5 m (including 36.06 g/t Au over 0.50 m). Gold mineralization is localized along silicified and pyritized east-west striking axial zones of tightly folded iron formation. Elsewhere on the property, grab samples from quartz veins assayed as high as 5.63 g/t Au with 7.25 ppm Ag.

- **Portage Property:** The most significant result from rock sampling is 3.18 g/t Au in a grab sample from a narrow shear-hosted quartz vein. Anomalous gold values (up to 0.69 g/t Au) in grab samples from other parts of the property were reported from >1.5 m wide zones of intense shearing, silicification, carbonatization and quartz veining.

- **Hurley Property:** Grab samples were reported to assay from anomalous to as high as 54.09 g/t Au in shear hosted quartz veins.

Fronteer Development Group Inc. & Red Lake Resources Inc.

- **Swain East, Sol D'Or and Grace Properties:** Interpretation of the airborne geophysical survey suggests that the contiguous Swain East, Sol D'Or and Grace Lake properties are centred over the prominent Swain Lake deformation zone.

  A 2 km long zone of mineralization and alteration was outlined in the 2002 field season. This zone includes the Cliff Showing with a grab sample of 5.94 g/t Au and the Bobarris Showing with a grab sample of 1.85 g/t Au. Gold mineralization at both showings is associated with the presence of arsenopyrite and pyrite, and is hosted by intensely silicified and sheared rocks that are spatially associated with a regional unconformity separating volcanic rocks from overlying conglomerates. The partners believe this is analogous to the major unconformity in the Red Lake belt, which is spatially associated with all major gold deposits.

  The Swain East Property also includes VMS-style mineralization at the Beaver Pond Showing where grab samples of massive chalcopyrite in bleached or albitized pillow basalt assayed 40.22 g/t Au and 0.16% Cu.

- **Mink Lake Property:** A 2002 detailed airborne geophysical survey verified the continuity of a 2.4 km long corridor of quartz-carbonate veining underlying the Mink property, where prospecting by Fronteer in 2001yielded a grab sample assaying 35.59 g/t Au.

  The partners reported a 4 km long mineralized corridor called the Mink Lake Gold Trend. The trend encompasses 4 separate showings. The Loydex Showing returned grab samples assaying as high as 1.63 g/t Au; close to this showing, an historical drill hole, completed by Goldfields in 1987, intersected 1.03 ounces Au per ton over 5.0 feet.

  The Finn Showing returned a grab sample assaying 104 g/t Au, while historic channel samples by Goldfields Canadian Mining (in 1987) across the Finn Showing returned values as high as 30.07 g/t Au over 1.14 m. Grab samples up to 11.9 g/t Au were returned from the Hatch Showing and 12.59 g/t Au from the Peninsula Showing.

KAFKA GRANITE LLC

In 2002, Kafka Granite LLC quarried 1107 tonnes of high purity quartz from its Corless Quartz Property in Little Bear Lake and Knott Township area. The quarry is located in the eastern periphery of the Trout Lake batholith, approximately 5 km from the contact with metavolcanic rocks of the Confederation Lake greenstone belt. The quartz vein is a lenticular mass striking 045°. It is approximately 25 m wide at the quarry site and is of undetermined strike length. The host rock is biotite granodiorite and minor pegmatite. A decimetre-thick vein of coarse-grained, barren pyrite occurs at the northern contact between the quartz vein and its granodiorite host.

KING'S BAY GOLD CORP.–SOLITAIRE MINERALS CORP.

The companies concentrated efforts on their Garnet Lake property (totalling 32 claim units) in Belanger Township, approximately 14 km southwest of Selco's past producing South Bay Mine (1.6 million tons of ore averaging 11.06% Zn, 1.8% Cu and 2.12 ounces Ag per ton). Selected grab samples as high as 15.0 g/t Au are reported from King's Bay preliminary surface sampling program of a quartz vein stockwork.

An initial 15 hole shallow diamond drill program (totalling approximately 915 m) was completed in 2002. Highlights include 1.23% Cu, 1.1 g/t Au, 6 g/t Ag and 14.5 g/t U over 4 feet from Hole 8; 2.82% Cu, 1.3 g/t Au, 15.5 g/t Ag and 11.5 g/t U over 2 feet from Hole 10; 2.06% Cu, 7.66 g/t Au, 15 g/t Ag and 10 g/t U over 1.0 foot from Hole 14 (King's Bay Gold, News Release, October 30, 2002). The extensive zone of sulphide mineralization is hosted in basaltic and gabbroic rocks. An expanded drill program is being planned to further delineate this 2000 foot long structure, which is reported open along strike and at depth. A ground MAG and VLF EM survey were carried out in preparation for a second stage of deeper diamond drilling.

RED LAKE RESOURCES INC. (FORMERLY GLENHAVEN VENTURES INC.)

Red Lake Resources Inc. holds options to acquire varying interests from 50% to 100% in 20 mineral properties in the Red Lake/Birch–Uchi greenstone belts of northwestern Ontario. It has exploration option agreements in place with Fronteer Development Group Inc., Renaissance Mining Corp., Masuparia Gold Corporation, and Grande Portage Resources (*see* Table 5). Three properties are wholly held by Red Lake Resources: the Mitchell–Dent Property, the Shabumeni Lake Project and the Goodall Property. An airborne magnetic survey was carried out over the Mitchell–Dent property, as well as geological mapping, prospecting line cutting and soil sampling. The Shabumeni and Goodall properties were not explored in 2002 (for details on other exploration work, *see* "Fronteer Development Group Inc.").

SKYHARBOUR DEVELOPMENT LTD.

Skyharbour Development Ltd. has 2 properties in the Birch–Uchi belt, the 2040 acre Uchi Lake property and the 320 acre Surprise Lake property, both 100% owned by Skyharbour. Only a limited amount of prospecting and sampling work was carried out on these 2 properties, but further work is planned for 2003.

SUNRIDGE GOLD CORP.

Sunridge Gold Corp. formerly held 4 properties in the Birch–Uchi belt, but dropped the option on all of them except the McIntyre property. Prior to dropping these options, consultants working for Sunridge carried out data compilation on the McIntyre, Maskootch and Northgate properties.

TRIBUTE MINERALS LTD.

Tribute Minerals Ltd. explored 3 properties in the Birch–Uchi belt. The Richardson Lake property (joint ventured with Continuum Resources Ltd.) and the Fredart Lake and Ben Lake properties.

- **Richardson Lake Property:** consists of 6 contiguous unpatented mining claims (75 units) covering 1200 hectares adjacent to the past producing Argosy and Kostynuk Brothers mines. The property contains a previously explored inferred mineral resource of 700 000 tons grading 0.20 ounce per ton gold.

- **Ben Lake Property:** is located near Tribute/Noranda Inc.'s Snake Falls property, which has an extensive hydrothermal vent zone containing sphalerite stringers within hydrothermal alteration, identified by Noranda in previous exploration programs. The TITAN-24 demonstration survey tested an area 1 by 2.5 km covering the Ben stringer zone, which returned intersections containing disseminated Cu-Zn sulphides over 45.6 m during previous exploration. The demonstration survey on the Ben property was funded in part by the OMET program, geared toward developing and testing innovative mineral exploration technologies and methods that promise to enhance the efficiency of exploration in Ontario.

WOLFDEN RESOURCES INC.

Wolfden Resources Inc. holds 3 properties in the Birch–Uchi belt. The Narrow Lake property (optioned to Newmont Canada Ltd.), near the past-producing Bathurst Mine, the Skinner Property now joint ventured to Teck Cominco Limited and the Argosy Mine property joint ventured with First Au Strategies Corp.

- **Argosy Mine Property**: Wolfden is operator of this joint venture with First Au Strategies Corp. In the early 1930s and again in the early 1950s, the Argosy Gold Mine produced a total of 101 875 ounces of gold at an average grade of 12.7 g/t Au (0.37 ounce per ton gold) to a maximum depth of 270 m (900 feet). In 2002, a

nine-hole drill program (totalling 1500 m) was completed to test the depth potential of 2 of the historically mined zones and also several unmined veins on the property. A single hole, drilled to test the down-dip extension of the No.2 Vein Zone (mined in the 1930s) intersected the No.5 Vein, and also the No.3 and No.2 Veins deeper than any previous work on the property. Highlights include 10.64 g/t across 1.2 m in the No.3 Vein, and 11.75 g/t across 1.55 m in the No.2 Vein. A single drill hole tested the unmined No.8 Vein, which returned an intersection of 12.02g/t (0.35 ounce per ton) Au across 1.29 m (Wolfden Resources, News Release, November 7, 2002).

- **South claim block of the Argosy Property**: The South claim block is an extension of the Argosy Property (contiguous with it) and is also named the Casummit Creek claim group. The First Au Strategies Corp joint venture includes this claim group along with the Argosy Mine property. Previous exploration work resulted in the discovery of a mineralized shear zone with an associated soil geochemical anomaly. Further work is planned for 2003.

Northern Greenstone Belts

AURORA PLATINUM CORP.

In 2000 and 2002, Aurora Platinum Corp. entered into 2 agreements with Inco Limited, whereby Aurora acquired proprietary analogue geophysical airborne survey data for several areas in the Sachigo Subprovince. Company directors decided Aurora should concentrate on its core business, exploring for Cu-Ni-PGE deposits; therefore under 2 separate agreements:

1) **Superior Diamonds Inc**. (formerly Consolidated Ouro Brasil Ltd.) acquired the diamond exploration rights on Aurora's 16 claims north of Lansdowne House, Ontario (Thunder Bay North District), in addition to kimberlite target information and the non-exclusive right to explore and develop for diamonds in certain areas of the Thunder Bay North and Red Lake districts; and

2) **Lake Shore Gold Corp.** (formerly Consolidated Takepoint Ventures Ltd.) acquired the rights to explore for and develop gold and other minerals, exclusive of diamonds and kimberlites, on the claims north of Lansdowne House and in certain other areas of interest in Thunder Bay North and Red Lake districts.

During the summer of 2002, Superior Diamonds completed a helicopter-supported till and soil sampling program to evaluate 10 magnetic anomalies in the Stull Lake area and 12 anomalies in the Muskrat Dam area. A number of targets were identified for more detailed follow-up in 2003.

At the same time, Lake Shore Gold undertook a program of geological mapping, prospecting, chip sampling and till and heavy mineral geochemical sampling in its area of interest. Stockwork veining in a gabbroic unit in the Rapson Bay area returned 12.1 g/t Au over a 4 m chip sample (Lake Shore Gold, News Release, January 14, 2003). Further sampling and ground geophysics are planned to follow-up this mineralization.

GOLDEYE EXPLORATIONS LIMITED

Goldeye Explorations Limited controls a 326 claim unit property, located in the Rathouse Bay (Sandy Lake) and Granite Bay of Sandy Lake claim map areas. The property is underlain by an Mesoarchean volcanic sequence, similar in age to the sequence underlying the Red Lake belt, 170 km to the south. The northern portion of the area is underlain by a 2 km long folded ultramafic unit with historical occurrences of up to 4 ounces Au per ton and 0.34 ounces Au per ton over 6 m. The southern part is underlain by the volcano-sedimentary package, which includes the BF and SB VMS occurrences.

Goldeye completed prospecting and ground geophysical surveys on the BF and SB VMS occurrences in 2002. The showings are associated with interflow rhyolite tuffs. The SB zone is associated with FII-type rhyolite wallrock; FII-

type is associated with VMS-productive environments, e.g., the Mattabi and Geco deposits.
The BF showing is 15 m in width and is associated with a strong 300 m long vertical loop EM conductor that is open to the east and west. Previously taken grab samples assayed 1.1% Cu, 0.03 ounce gold per ton and 10.6 ounces silver per ton.

The SB zone is located on the north shore of Sandborn Bay, 3.8 km east of the BF showing. The mineralization is 4 m thick and has a weak vertical loop EM signature 100 m long. Previous grab samples assayed up to 9% Zn and 0.1% Cu.

WALLBRIDGE MINING COMPANY LTD.

Wallbridge holds 571 claim units as shown on Figure 2. They carried out data compilation and limited prospecting and ground investigation of compiled data.

WOLFDEN RESOURCES INC.

The Rapson Bay Property is located approximately 35 km east of Wolfden's Monument Bay Property, Manitoba, and is interpreted to be an extension of the Monument Bay shear zone. Preliminary prospecting work was carried out during 2002. Wolfden's Borthwick Lake and Lingman Lake properties were sold to Anaconda Gold Corp.

RESIDENT GEOLOGIST STAFF AND ACTIVITIES

At year end, staff of the Red Lake Resident Geologist's office comprised Andreas Lichtblau, Regional Resident Geologist, Carmen Storey, District Geologist and Lynn Kosloski, District Support Geologist. Caroline Lichtblau was employed for 7 weeks as office assistant in the Summer Experience Program.

An exploration and mining update for the Red Lake–Kenora Regional Resident Geologist's District was given at the Mines and Minerals Symposium of the Northwest Ontario Prospectors Association in April. A presentation on the same topic was given to the Red Lake Branch of the CIM in June and an updated version was given at the OEGS, held in Toronto, in December.

Staff gave talks to Dryden MNR, Dryden and Red Lake Local Citizens Advisory committees and the Northwest Smart Growth Committee.

Resident Geologist staff participated in Keewaytinook Okimakanak's Science and Technology Camp 2002, by giving talks and presenting a "Rocks & Minerals" display to elementary school children in McDowell Lake, Deer Lake, Poplar Hill and Ft. Severn First Nation communities. A historical mining and exploration display was set-up for the 11th Annual Norseman Festival held in July.

Resident Geologist staff attended the 48th Annual Meeting of the Institute of Lake Superior Geology in Kenora. Underground trips to the 2 producing gold mines in Red Lake were arranged for 40 participants. Staff then led a surface tour of the central Red Lake belt.

DRILL CORE STORAGE SITE

The remote diamond-drill core storage compound is located 6 km south of Red Lake, on Highway 105. The compound is operated as a self-serve facility by the Red Lake Resident Geologist's Office. The Kenora Drill Core Library houses an additional 14 529.9 m of diamond drill core from the Red Lake District.

In 2002, there were 15 users of the remote drill core facility. Two companies donated drill core (totalling 1405.6 feet) to the facility:

- Barrick Gold Corporation: Red Lake Gold Shore Mine Property in Dome Township - 7 holes (845.2 ft) (P. Brugger, Lac Properties Inc., written communication, 2003).
- Central Geophysics Ltd.: Conifer Lake Complex in the Sumach Lake Area - 2 holes (560.4 ft).

PROPERTY EXAMINATIONS

Major authorship of the following property examinations is indicated in parentheses following the titles.

Table 7. Property visits conducted by the Red Lake Regional Resident Geologist and Staff in 2002.

Number (keyed to Figures 2 to 5)	Property/Occurrence
1	Windfall Road Pegmatite, Gould Lake Area
2	Corless Quartz (Kafka) Quarry, Little Bear Lake Area & Knott Township
3	Lake Rowan Mine, Todd Township
4	Pine Ridge Sulphide Reconnaissance, McDonough Township
5	Sandy Creek East Reconnaissance, Camping Lake Area
6	Bathurst North Occurrence, Skinner Township
7	Martene Road Reconnaissance, Coli and Nungesser Lake areas
8	Mile 27 Road Reconnaissance, Blackbear Lake Area
9	King's Bay Gold Corporation, Garnet Lake Property, Belanger Township
10	Noranda Inc./Tribute Minerals Inc. Core Storage site, Karas Lake Area
11	Goldcorp Inc.'s Marcus and Cochenour–Willans Mine Crown Pillar drill sites, Dome Township
12	Bathurst Mine, Skinner Township
13	Gold Eagle Mine, Dome Township
14	Whitehorse Island (Sanshaw Occurrence), Dome Township
15	Kelson Farm, Howey Diorite Study, Dome Township
16	Snib Lake, Unconformity Study, Heyson Township
17	Coin Creek Reconnaissance, Baird Township
18	North Spirit Lake First Nation, Pakwan Lake Area
19	Poplar Hill First Nation, Berens River Area
20	Nova-Co Property, Heyson Township
	Goldrock Area, Boyer Lake Area (Kenora District)
	Giant Prospect, Boyer Lake Area (Kenora District)

Bathurst Mine (C.C. Storey)

The Bathurst Mine is located in Skinner Township on the shore of Car Lake 70 km east-northeast of Red Lake. Access is by the Joyce road, a logging road that extends north from the South Bay Mine Road (Figure 6) Gold mineralization was first identified here in 1926 (Greig 1928). Bathurst Mines Ltd. acquired the property in 1927 and sank a two-compartment shaft to 223 feet in 1928. The shaft was deepened to 300 feet in 1929 and to 420 feet in 1934 with lateral workings on the 200- and 300-foot levels. A 10 ton per day Tremaine stamp mill was installed in 1929 and a total of 307.57 ounces of gold and 92 ounces of silver were produced by 1936. Intensive surface and underground exploration continued until 1937 (Parker and Atkinson 1992).

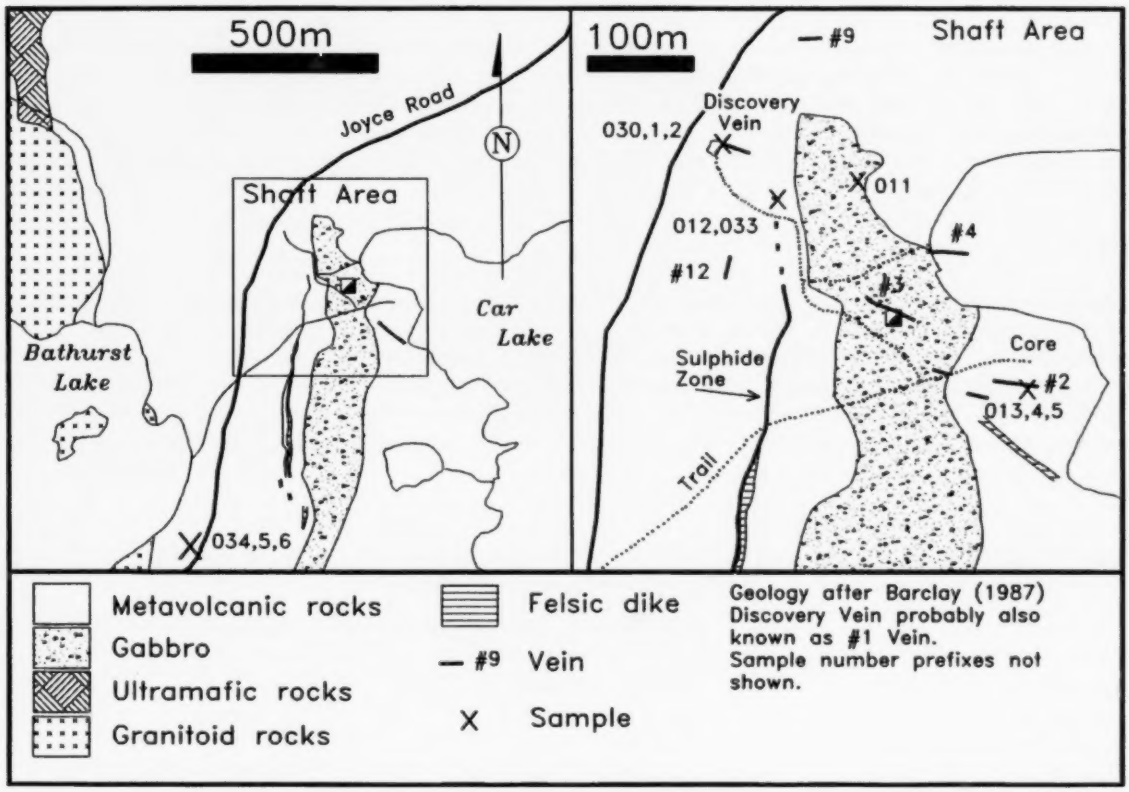

Figure 6. Bathurst Mine: location and shaft area geology.

Recorded surface exploration commenced again in 1958 when Bathurst Selective Mines Securities Ltd. conducted surface stripping, trenching and sampling on the property. Surface exploration for various parties was carried out until 1987; Parker and Atkinson (1992) give a complete summary of work carried out until 1987. There is a published inferred mineral resource of 80 000 tons grading 0.578 ounce gold per ton on the Bathurst property (Parker and Atkinson, 1992). Skinner Township has been mapped by Greig (1928), Bruce (1929), Harding (1936), Pryslak (1986) and in part by Thurston (1985). The geology of the property has been described by Greig (1928), Bruce (1929), Harding (1936) and several unpublished descriptions are on file as assessment work.

The Bathurst property is underlain by pillowed and massive mafic metavolcanic rocks assigned to the 2800–2900 Ma Woman assemblage (Stott and Corfu 1991) formerly Cycle II of Thurston (1985). The metavolcanic rocks have been intruded by coarse-grained gabbroic and dioritic dikes and sills and numerous felsic dikes (*see* Figure 6). Both Pryslak (1986) and Barclay (1987) indicate ultramafic rocks to the northwest of the Bathurst workings. The mine

site is approximately 600 m east of the contact between mafic metavolcanic rocks and the granitoid rocks of the Trout Lake batholith. The rocks at the Bathurst Mine have been affected by the east-northeast-trending Swain Lake deformation zone and the contact strain aureole of the Trout Lake batholith (Parker and Atkinson 1992). Property scale mapping by Barclay (1987) indicates foliation subparallel to the Trout Lake batholith contact with a shear fabric striking east-southeast. Pryslak (1986) indicates the pillowed basalt units trend north-northeast and face to the east. Fyon and O'Donnell (1986) indicate the greenschist to amphibolite facies metamorphic isograd passes through the Bathurst property.

The Bathurst property has at least 14 numbered mineralized shear zones (Barclay 1987) hosting white sugary quartz veins and many more minor quartz veins. Varying amounts of sulphide minerals (pyrite, pyrrhotite, sphalerite, chalcopyrite, galena and arsenopyrite) are present in many of the veins and in the shear zones that contain the veins. Coarse visible gold is reported from the mine, but none was seen during this examination. The veins and shear zones have an east-southeast trend with the exception of the northerly trending No.12 Vein and the sulphide zone. Detailed property scale mapping has located a large number of veins, but actual mining was restricted to No.1, 2, 3 and 4 veins. Alteration is largely confined to the shear zones where chlorite and talc are well developed, as well as silicification; iron carbonate is only a minor feature. A sample of sheared chloritic rock from the dump at the shaft was subjected to X-ray powder diffraction and was found to contain clinochlore, talc and calcite. There are a large number of trenches and pits on the property, but most are heavily overgrown and many are partly filled by slumped overburden. The property geology in Figure 6 is based on property scale mapping by Barclay (1987) and Hinse (1979).

Assay results from grab samples taken from several of the veins exposed in the old pits are shown in Table 8, and sample descriptions are shown in Table 9. Gold values are highly variable, but are often associated with the presence of base metal sulphides. The results are comparable to previously published assays from the Bathurst property and indicate both the erratic nature of gold mineralization on this property and the propensity for high gold values. Samples of gabbro from both outcrop and Eastmont Gold Mines Ltd. diamond drill core were taken for PGE analysis. Only one sample from the Eastmont drill core (*see* Table 9) returned a platinum value above detection limit (9.07 ppb Pt), but the location of the drill hole is not known.

Table 8. Bathurst Mine grab sample assay results.

Analyte Units *Detection Limit*	**Co** ppm *1*	**Cr** ppm *1*	**Cu** ppm *2*	**Ni** ppm *5*	**Pb** ppm *0.1*	**Zn** ppm *5*	**Au** ppb *5*	**Au** oz/ton *0.01*	**Ag** ppm *1*	**Pd** ppb *8*	**Pt** ppb *8*
2001CS-028	57.58	86.33	287.71	118.88	10.9	233.22	608.87		2		
2001CS-030	N.D.	7.3	7.92	N.D.	10.6	11.04	N.D.		N.D.		
2001CS-036	44.38	194.77	354.22	112.03	3.88	91.3	6.6		3		
2001CS-031	51.19	396.46	155.89	182.03	6.46	166.41	25.06		3		
2001CS-032	N.D.	5.19	5.41	N.D.	1.58	7.97	N.D.		N.D.		
2001CS-033	30.27	172.23	678.08	83.73	81.95	162.56	N.D.		3		
2001CS-034	1.39	3.32	44.08	N.D.	1.68	9.1	14.25		N.D.		
2001CS-035	19.65	50.11	596.14	29.7	26.16	26.08	546.05		2		
2002CS-011	51.45	11.36	355.16	50.88	2.34	146.63	12.09			N.D.	N.D.
2002CS-012	35.67	78.2	883.16	89.68	32.4	64.25	>1000.00	0.07			
2002CS-013	7.02	27.41	49.9	6.77	246.62	453.09	>1000.00	0.17			
2002CS-014	1.69	53.62	25.86	N.D.	692.69	554.66	>1000.00	0.81			
2002CS-015	1.78	65.13	83.02	N.D.	358.91	407.2	>1000.00	0.23			
2002CS-016	56.37	233.94	313.25	131.12	2.56	125.66	8.08			N.D.	N.D.
2002CS-017	52.73	104.7	266.82	116.98	2.01	127.95	7.43			N.D.	9.07

Analyses by Geoscience Laboratories, Ministry of Northern Development and Mines, Sudbury, ON.

Table 9. Bathurst Mine sample descriptions.

Analyte Units *Detection Limit*		Au ppb *5*	Au oz/ton *0.01*
2001CS-028	Sulphide rich material shaft dump	608.87	
2001CS-030	Quartz vein golden sidewalk pit	N.D.	
2001CS-031	Chloritic schist septa golden sidewalk pit	25.06	
2001CS-032	Quartz vein golden sidewalk pit	N.D.	
2001CS-033	Sulphide zone pit	N.D.	
2001CS-034	Quartz vein	14.25	
2001CS-035	Sulphide bearing quartz vein	546.05	
2001CS-036	Silicified rock with sulphides	6.6	
2002CS-011	Gabbro	12.09	
2002CS-012	Sulphide zone pit	>1000.00	0.07
2002CS-013	#2 quartz vein	>1000.00	0.17
2002CS-014	#2 quartz vein from dump at trench	>1000.00	0.81
2002CS-015	#2 Quartz vein	>1000.00	0.23
2002CS-016	Gabbro from Eastmont core hole 87E2	8.08	
2002CS-017	Gabbro from Eastmont core hole 87E4	7.43	

The Bathurst Mine has a history of high-grade gold mineralization and spectacular samples have been obtained from the property. The association of gold with deformation zones in mafic metavolcanic rocks and the presence of nearby ultramafic intrusive rocks make a favourable comparison to the Red Lake gold environment. The Bathurst Mine area, lying within the western extension of the Swain Lake deformation zone, makes an attractive exploration target for gold mineralization.

Howey Diorite (A. Lichtblau)

Howey "diorite" is an elongate multiphase intermediate to felsic intrusion that extends 6 km east and west across the northern portions of Heyson and Byshe, and southeastern Dome, townships. It attains its maximum thickness, of approximately 2.5 km, along the Heyson–Byshe township line.

The intrusion is generally moderately to intensely deformed and altered, making the protolith sometimes obscure. In some localities, altered and deformed metavolcanic or metasedimentary rocks have been mapped as Howey diorite. Weak to intense carbonatization and chloritization characterize many exposures. Mylonite zones and varying intensities of brecciation are common; the intrusion is cut by numerous sets of quartz, quartz-carbonate and quartz-carbonate-tourmaline veins and veinlets, occasionally gold bearing (Photo 1). The intrusion is host to several mineral occurrences, e.g., gold-bearing quartz stringers (McManus Red Lake, Dome Township); auriferous quartz stringers in iron formation xenoliths (Duroc Red Lake, Heyson Township); and an occurrence of cobalt bloom ("erythrite") and gersdorfite (Ni-arsenide) in exposures along the southern shore of the Chukuni River in Balmer Township (Peterson Red Lake occurrence).

A spectacular magnetite breccia zone occurs in the northeast corner of Heyson Township. Approximately 20% corroded magnetite crystal aggregates cement fractured Howey diorite in a jig-saw type pattern (Atkinson, Parker and Storey 1991). A sample of magnetite breccia submitted for analysis contained 4 ppb Au and 20 ppm As.

Lithogeochemical data (Table 10) from the Howey intrusion plot in the andesite to rhyodacite fields on a Zr/TiO_2–Nb/Y diagram (Winchester and Floyd 1977) and show clear tholeiitic affinities on a FeO–MgO–Na_2O+K_2O diagram (Figure 7; Irvine and Baragar 1971). The intrusion has never had geochronological analyses, but is speculated to be the same age as the hornblende-biotite granodiorite Dome stock (i.e., 2718 ± 1 Ma, Corfu and Andrews 1987).

Table 10. Selected Howey Diorite analyses.

Sample No.		2002-AL-005	2002-AL-006	2002-AL-007	2002-AL-010	2000CS-079	2001-AL-031H
Field Name		Howey Diorite	Howey Diorite	Howey Diorite	Howey Diorite	Intermediate Sill	Howey Diorite
Rock Type		Qtz-monzodiorite	Tonalite	Tonalite	Tourmalinite	Granodiorite	Qtz-diorite
SiO2	%	60.56	59.20	59.19	61.62	58.91	47.74
TiO2	%	0.77	1.01	1.00	0.97	1.32	2.26
Al2O3	%	15.24	16.74	17.04	16.82	12.82	17.46
Fe2O3	%	7.58	10.08	9.87	10.24	15.53	15.53
K2O	%	1.62	1.38	1.61	1.40	0.34	0.27
MgO	%	1.08	1.90	2.24	2.11	1.54	3.74
MnO	%	0.13	0.12	0.12	0.12	0.29	0.20
CaO	%	4.16	5.15	1.66	0.87	5.17	4.07
Na2O	%	5.01	4.01	3.14	2.32	3.72	4.80
P2O5	%	0.21	0.28	0.19	0.20	0.36	0.94
LOI	%	3.29	1.63	2.51	2.06	0.30	3.85
TOTAL	%	99.66	101.50	98.57	98.73	100.30	100.85
Rb	ppm	29.01	30.18	59.56	40.52	12.84	nd
Ba	ppm	489.99	388.22	325.55	321.76	122.08	69.00
Sr	ppm	191.74	338.85	221.70	136.90	80.50	215.00
Sc	ppm	11.29	15.47	14.72	14.46	25.49	15.00
La	ppm	33.86	29.94	18.43	22.43	23.42	nd
Ce	ppm	76.17	67.82	37.52	48.42	58.06	nd
Nd	ppm	36.61	34.71	19.29	23.13	39.70	nd
Sm	ppm	7.98	7.80	4.03	5.06	10.94	nd
Eu	ppm	2.03	2.10	1.09	1.22	2.98	nd
Gd	ppm	8.48	8.37	3.66	4.62	12.87	nd
Tb	ppm	1.29	1.30	0.51	0.67	2.31	nd
Yb	ppm	3.79	3.58	1.61	2.06	9.01	nd
Lu	ppm	0.56	0.52	0.26	0.33	1.36	nd
Y	ppm	40.51	42.99	14.07	18.25	91.39	17.00
Zr	ppm	130.16	84.32	166.90	190.24	252.92	nd
Th	ppm	5.03	4.38	4.04	4.83	2.96	nd
U	ppm	1.27	0.89	1.16	1.32	0.82	nd
Hf	ppm	3.98	2.77	4.48	5.33	7.01	nd
Nb	ppm	14.11	13.01	9.83	11.52	16.42	nd
Ta	ppm	0.94	1.10	0.74	0.77	1.54	nd
Cs	ppm	1.16	1.96	8.43	4.12	1.48	nd
Dy	ppm	7.39	7.50	2.58	3.74	14.71	nd
Er	ppm	3.98	4.17	1.52	2.06	9.38	nd
Ho	ppm	1.55	1.59	0.57	0.73	3.42	nd
Pr	ppm	9.26	8.51	4.85	5.83	8.55	nd
Tm	ppm	0.57	0.57	nil	0.31	1.38	nd
Ga	ppm	22.42	24.75	19.58	18.86	24.35	nd
Li	ppm	15.46	18.41	13.70	12.13	10.02	26.00
Mn	ppm	800.54	750.87	699.63	883.64	1813.49	nd
Mo	ppm	1.82	nil	nil	1.08	1.54	nil
Sb	ppm	1.59	3.12	1.42	1.44	nil	nd
Sn	ppm	1.77	1.39	1.10	1.44	1.77	nd
Tl	ppm	nil	nil	0.63	0.41	nil	nd
V	ppm	26.55	48.41	88.22	93.70	14.02	50.00
W	ppm	0.65	0.23	1.70	1.64	0.97	nil
Zn	ppm	105.48	101.48	94.34	79.93	139.73	133.00
Pb	ppm	5.07	5.97	7.27	7.50	4.33	nd
Cu	ppm	36.40	24.24	34.15	57.04	39.54	nil
Cr	ppm	7.77	16.30	34.64	57.42	nil	nil
Ni	ppm	nil	11.70	26.62	38.51	nil	15.00
Co	ppm	12.68	19.08	13.81	21.66	11.93	44.00
Au	ppb	5.56	nil	39.51	6.83	0.02	nil
Pd	ppm	nil	nil	nil	nil	nil	nil
Pt	ppm	nil	nil	nil	nil	nil	nil
UTM (NAD27)	N	5651956	5651956	5652099	5652099	5647808	5652113
UTM (NAD27)	E	443912	443912	443537	443537	438875	442735

Analyses by Geoscience Laboratories, Ministry of Northern Development and Mines, Sudbury, ON. (note: nd means not determined)

At its eastern extent, Howey diorite is intruded along the contact between calc-alkaline McNeely (2745 to 2742 Ma) and tholeiitic Heyson (ca. 2739 Ma) sequences of the Confederation assemblage. At its western extent, in the vicinity of the past-producing Howey and Hasaga mines, it is interpreted to have cross-cutting relationship to the Huston conglomerate, which forms the base of the Neoarchean Confederation assemblage. The gold-bearing quartz porphyry dike mined at the Howey and Hasaga mines (total production of 639 805 ounces gold) is emplaced parallel to a strong (locally protomylonite) 065° fabric developed within the conglomerate. Competency contrasts between the dike and its wall-rocks, comprising conglomerate ("volcanic breccia") and Howey diorite, are believed to have favoured the formation of ore-related fracturing in the quartz porphyry dike, as opposed to more ductile conglomerate and diorite (Horwood 1945).

Photo 1. Howey Diorite, strongly carbonate altered and with quartz-tourmaline veins (scale card in centimetres).

Competency contrasts among ultramafic, felsic and mafic volcanics are believed to have been very important in the development of dilatant fluid pathways for gold deposition in the High Grade Zone at the Red Lake Mine (Twomey and McGibbon 2001). Howey diorite is intensely deformed and altered, under certain conditions, e.g., in contact with felsic flows or intrusions, it may have acted as a less permeable barrier focussing fluid flow in potentially more brittle wall-rock. Such conditions may have occurred where Howey diorite is in contact with

- sheared portions of the Dome stock under Howey Bay of Red Lake;
- Huston conglomerate in the vicinity of the Howey and Hasaga mines, where strong shearing (along the previously defined Flat Lake–Howey Bay deformation zone) could have concentrated local fluid flow;
- competent volcanic rocks of the Heyson or McNeely sequence, where local structural zones intersect the contact at a high angle.

In the Madsen area, Baird Township, thin (approximately 100 m wide and 2500 m long), fine-grained intermediate sills, intruded immediately above the unconformity between the Mesoarchean and Confederation assemblages, may be intrusions of Howey diorite (sample 2000CS79) into basal Heyson sequence rhyolite flows. It can be speculated

that Howey diorite represents a shallow, subvolcanic intrusion of Heyson age, that may have fed overlying Heyson sequence intermediate flows.

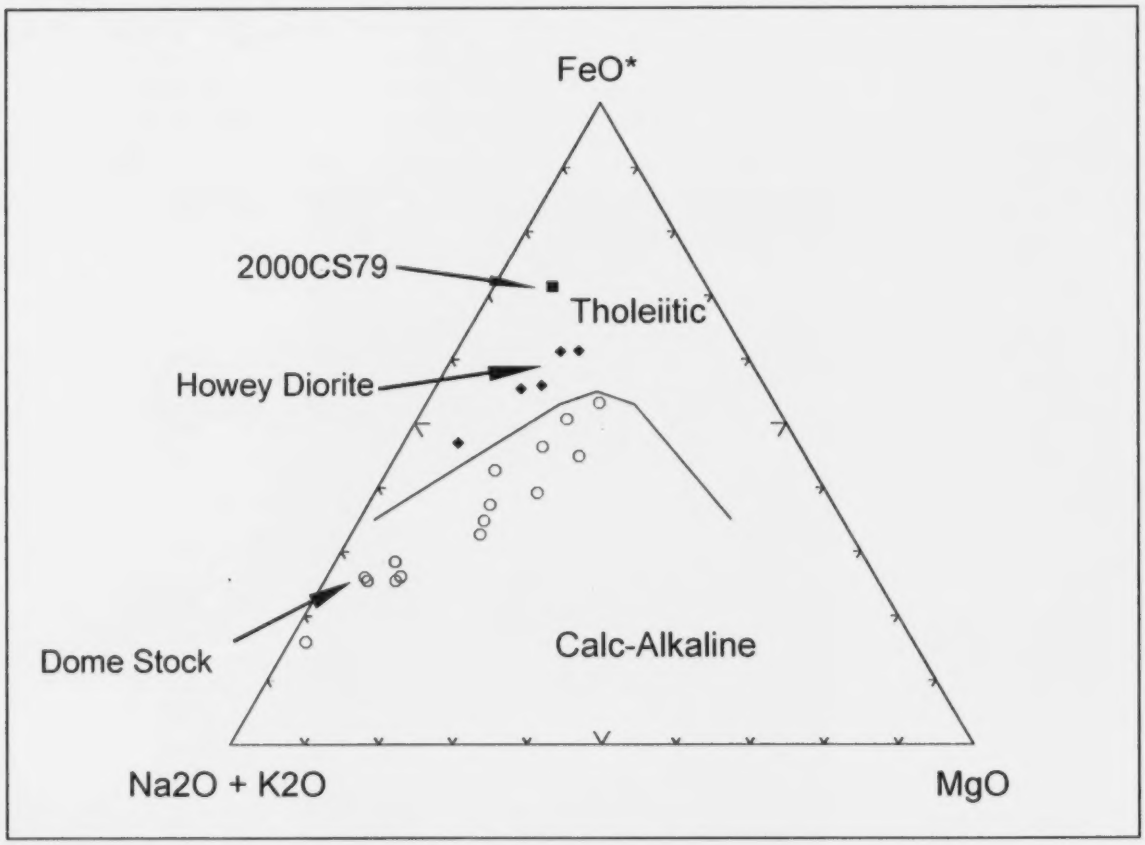

Figure 7. FeO–MgO–Na_2O+K_2O diagram of selected Howey diorite and Dome stock samples.

Jubilee Lake (C.C. Storey)

The Jubilee Lake pegmatite showing is located on the north shore of Jubilee Lake in Birkett Township and can be reached either from the lake or by traverse through the bush from the end of the Jubilee Lake portage. The Wenesaga Road crosses the portage as shown on Figure 8. A rough trail extends from the portage to the lakeshore near an outpost camp on the north shore. The showing can then be reached by walking northeast parallel to the lakeshore.

The area was mapped by Bateman (1940), who indicated the bedrock to be metasediments and minor mafic metavolcanics intruded by numerous pegmatites and granitoid rocks. More recent mapping by Thurston (1980) did not cover this part of Birkett Township, although he did indicate abundant muscovite-bearing pegmatites 4 km to the north of the showing. Bowen (1989) mapped the area of Jubilee Lake south of the showing as clastic metasediments and derived migmatites intruded by granite and minor pegmatite. Breaks et al. (1976) mapped to the south of Birkett Township and identified a large area of pegmatitic granitoid rocks. There is no recorded exploration activity on the Jubilee Lake pegmatites, but the occurrence referred to as the SJ Pegmatite was first discovered in 1964 by prospector Stan Johnson (Sherridon Johnson, prospector, personal communication, 1999). Breaks, Selway and Tindle (2001) examined the occurrence and the nearby pegmatitic rocks. The property is currently held by Sherridon Johnson and C.R. Girouard.

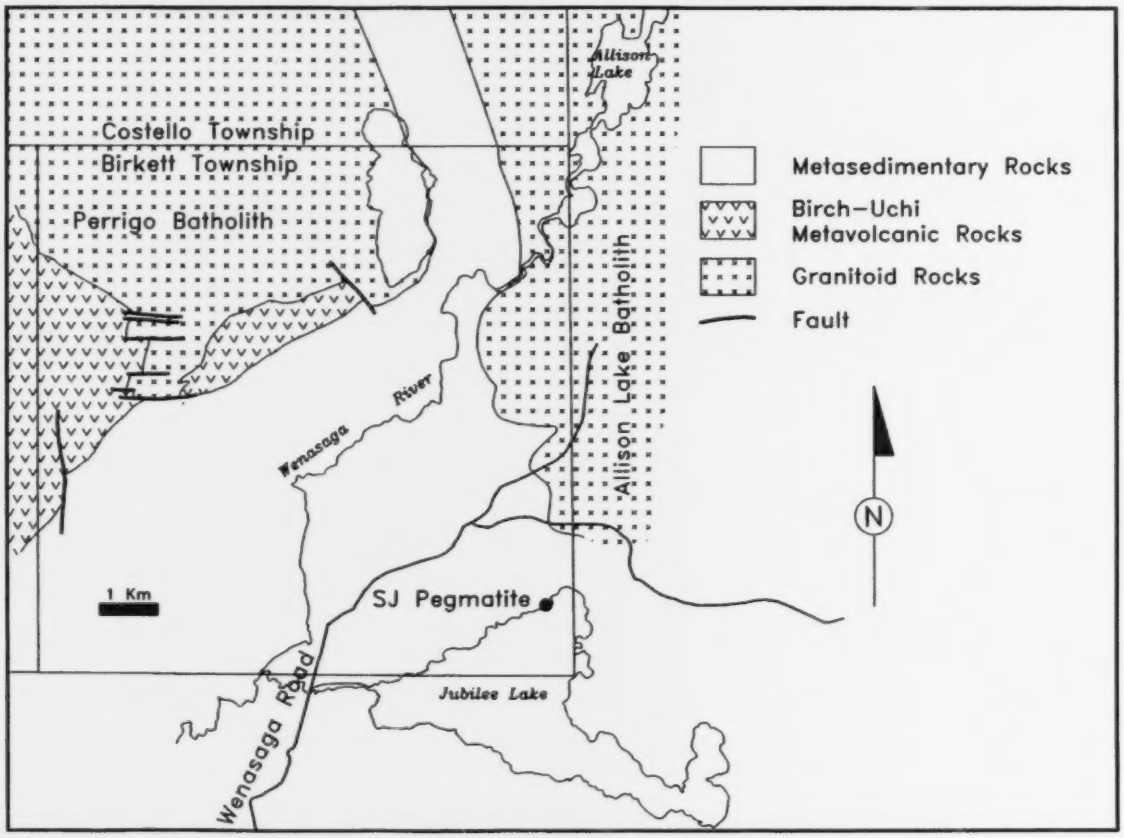

Figure 8. Geological setting of Birkett Township and the Allison Lake batholith. Geology *after* Thurston (1980) and Bateman (1940). For location of Birkett Township, *see* Figure 5.

The area is underlain by metasediments of the Birch–Uchi greenstone belt intruded by the Allison Lake batholith as shown on Figure 8. The metasediments exposed in the vicinity of Jubilee Lake show increasing metamorphic grade from upper greenschist grade at the Wenasaga Road to amphibolite grade to the east towards the Allison Lake batholith. Sedimentary layering is evident in bedrock exposures along the Wenasaga Road west of Jubilee Lake, but the rock exposed along the north shore of Jubilee Lake near the pegmatite dikes is garnet-bearing biotite metatexite cut by numerous narrow (10 cm or less) pegmatite veins and dikes. The Allison Lake batholith as described by Breaks, Selway and Tindle (2001) is a tadpole-shaped pegmatitic peraluminous granitoid mass on the east boundary of Birkett Township. The area to the east of Birkett Township has not been mapped in detail and the southeast part of Birkett Township was only mapped by Bateman (1940). The batholith contact is not well defined in the area between Jubilee Lake and Allison Lake. Mapping by both Thurston (1980) and Bateman (1940) indicate numerous xenoliths in the western part of the batholith. Breaks, Selway and Tindle (2001) show a sketch map of the batholith and surrounding rocks.

The Jubilee Lake beryl pegmatites are referred to as the Jubilee Lake pegmatite group by Breaks, Selway and Tindle (2001). The group consists of 3 dikes, the largest of which, the SJ pegmatite, was explored by 2 test pits as shown in Figure 9. This dike is in excess of 30m in width. The pegmatite is white in colour and is composed of potassium feldspar, quartz, albite and muscovite with accessory garnet, apatite and very minor pyrite; there are also very small black minerals that may be tantalum oxide minerals. Beryl is present as euhedral creamy white crystals best exposed in the No. 2 pit. The pegmatite shows quartz segregations with blocky white to pale pink feldspar crystals in the 5 to 20 cm size range, best exposed in the second pit. Pale green muscovite rich replacement masses are present in No. 1 pit. The dike contacts are not exposed, but Bateman indicates the SJ dike and several others nearby trend to the northwest.

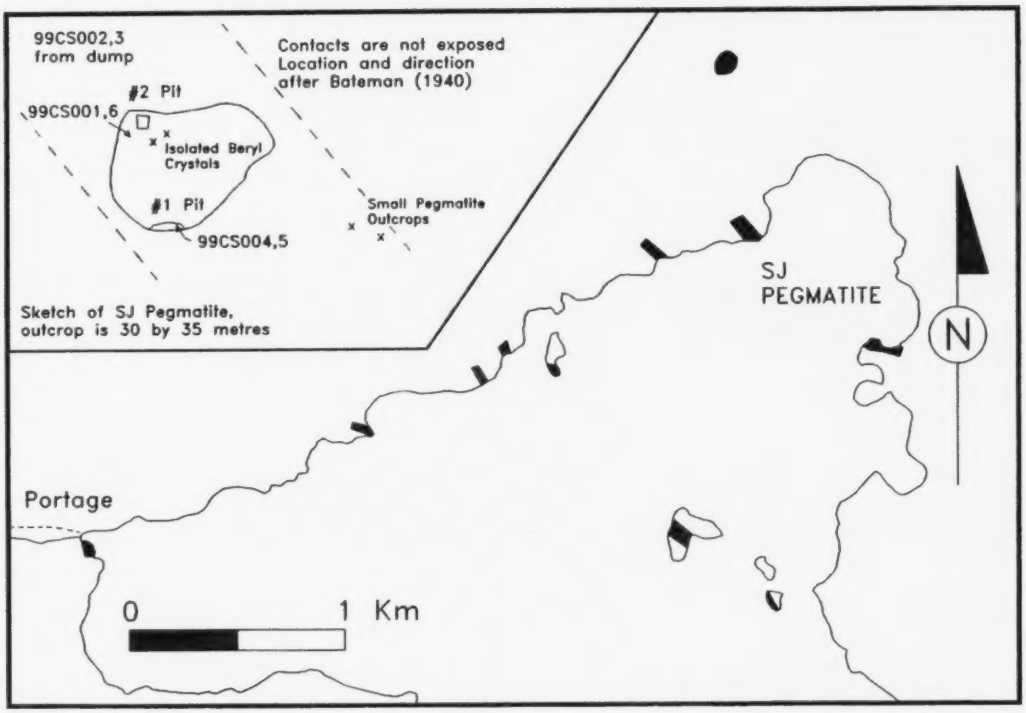

Figure 9. Jubilee Lake pegmatites. Sketch shows pits and sample locations on SJ pegmatite; widths are not to scale. Pegmatite locations shown by solid fill are *after* Bateman (1940).

Analytical results for samples taken from the pits on the SJ pegmatite are in Tables 11 through 14. The mineral identified in the field as beryl was confirmed to be beryl by X-ray diffraction. The elemental ratios K/Rb, K/Cs and Nb/Ta in both the potassium feldspar and the bulk pegmatite or fertile granite along with Na_2O/K_2O are useful to assist in evaluating the rare metal potential of a pegmatite. Breaks (1989) indicates that a low Na_2O/K_2O ratio indicates a less fractionated pegmatite (and therefore less rare metal potential), but there is considerable variation. In general, fertile granites and their associated pegmatites are enriched in lithium, cesium, berylium, gallium, yttrium, tin, tantalum/niobium and rubidium, such that these elements are a good exploration guide to potential rare element pegmatites.

The Rb/Sr ratio increases with fractionation, whereas K/Rb and K/Cs ratios decrease with fractionation (Breaks 1989). Results shown by Breaks (1989) and Černý and Meintzer (1988) show considerable variation even within samples from the same pegmatite, but the overall trend is to higher Rb/Sr ratios from rare element pegmatites even if absolute Li, Be and Cs values are relatively low. A plot of K/Rb versus Cs in potassium feldspar samples can differentiate between barren pegmatites, fertile granites and complex-type rare metal pegmatites.

In spite of this being a beryl pegmatite, the beryllium values are low. The samples show elevated Li, Cs, Rb and Ta and element ratios consistent with a fractionated pegmatite. The K/Rb versus Cs for one potassium feldspar sample is plotted in Figure 10 and falls in the fertile granite field. In comparison with average continental crust, Rb, Cs and Ta show significant enrichment over average continental crust values from Breaks, Selway and Tindle (2001). A Ta value of 173 ppm was obtained by Breaks, Selway and Tindle (2001) from the SJ pegmatite and a value of 74.46 ppm Ta was obtained from a bulk pegmatite sample from the No.1 pit (99CS004) in this study. Rb values are particularly high with the highest value (1864.20 ppm) obtained from a potassium feldspar sample.

The results of both this study and the work of Breaks, Selway and Tindle (2001) indicate a favourable target area for rare-element pegmatite mineralization in the southeast part of Birkett Township and the rocks along the western and southern margins of the Allison Lake batholith.

Table 11. Jubilee Lake samples and element ratios.

Sample	Location	Rb/Sr	K/Rb	K/Cs	Nb/Ta	Na_2O/K_2O
99CS001	potassium feldspar from quartz segregation No.2 pit	65.4	57.98	1681.8	1.75	0.196
99CS002	mineral ID beryl crystal from No.2 pit					
99CS002A	remainder of 99CS002	20.5	54.0	1243.5	2.84	1.98
99CS003	pegmatite with apatite No.2 pit	43.6	42.2	1049.7	4.11	1.82
99CS004	bulk pegmatite No.1 pit	25.8	53.3	1445.5	1.85	2.44
99CS005	muscovite replacement zone No.1 pit					
99CS006	remainder of sample 99CS001	33.0	55.8	1565.0	1.95	0.53

Table 12. Jubilee Lake trace element analyses, part 1.

Analyte	Be	K	Li	Mn	Mo	Na	P	S	W	Y	Zn
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	*3*	*100*	*3*	*1*	*8*	*10*	*50*	*30*	*40*	*2*	*2*
Average continental crust	3		20								
99CS001			16								
99CS002A	7	12186	35	345	9	22270	N.D.	1176	N.D.	N.D.	19
99CS003	4	14528	56	429	13	23905	N.D.	1175	N.D.	N.D.	23
99CS004	14	26452	43	3377	43	55348	86	1187	N.D.	N.D.	92
99CS005	10	44855	134	372	21	36388	N.D.	1183	N.D.	N.D.	60
99CS006	5	60958	33	651	15	30076	516	1180	N.D.	N.D.	22

Analyses by Geoscience Laboratories, Ministry of Northern Development and Mines, Sudbury, ON.

Table 13. Jubilee Lake trace element analyses, part 2.

Analyte	Ba	Cr	Ga	Pb	Sn	Rb	Sr	Nb	Cs	Ta	Th	Y	Zr
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	*5*	*1*	*1*	*0.1*	*3*	*>400*	*0.2*	*0.02*	*0.01*	*0.01*	*0.02*	*0.5*	*1*
Average continental crust			17			112		25	3.7	2.2			
99CS001	89	24	14.68	22.29	N.D.	1864.20	28.5	0.72	64.27	0.41	0.03	N.D.	2.82
99CS002A	23	20	12.45	3.86	N.D.	225.50	11.0	12.56	9.80	4.42	0.38	N.D.	23.22
99CS003	11	18	23.50	2.69	4.4	344.20	7.9	35.43	13.84	8.63	0.43	N.D.	15.83
99CS004	9	11	28.15	8.85	3.5	496.30	19.2	137.70	18.30	74.46	0.63	0.98	18.90
99CS005	10	7	84.49	2.90	21.3	1197.20	8.8	132.41	51.43	37.21	0.52	0.80	29.69
99CS006	33	10	16.97	14.77	N.D.	1093.20	33.1	6.43	38.95	3.34	0.54	0.80	5.86

Analyses by Geoscience Laboratories, Ministry of Northern Development and Mines, Sudbury, ON.

Table 14. Jubilee Lake major element analyses.

Analyte	SiO_2	Al_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	TiO_2	Fe_2O_3	LOI	TOTAL
Units	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%
Detection Limit	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.05*	*n/a*
99CS001	63.27	19.20	N.D.	0.16	0.13	2.55	13.02	0.37	0.01	0.10	0.66	99.47
99CS002A	87.02	8.52	0.05	0.07	0.11	3.14	1.58	0.12	0.01	0.26	0.45	101.33
99CS003	82.57	10.71	0.05	0.08	0.12	3.38	1.86	0.13	0.01	0.32	0.86	100.09
99CS004	66.77	18.52	0.43	0.07	0.30	7.89	3.23	0.35	0.01	0.86	0.59	99.02
99CS005	58.95	25.40	0.04	0.19	0.08	4.96	5.48	0.14	0.03	0.95	2.53	98.75
99CS006	70.15	16.17	0.09	0.06	0.31	4.19	7.88	0.45	N.D.	0.24	0.39	99.93

Analyses by Geoscience Laboratories, Ministry of Northern Development and Mines, Sudbury, ON.

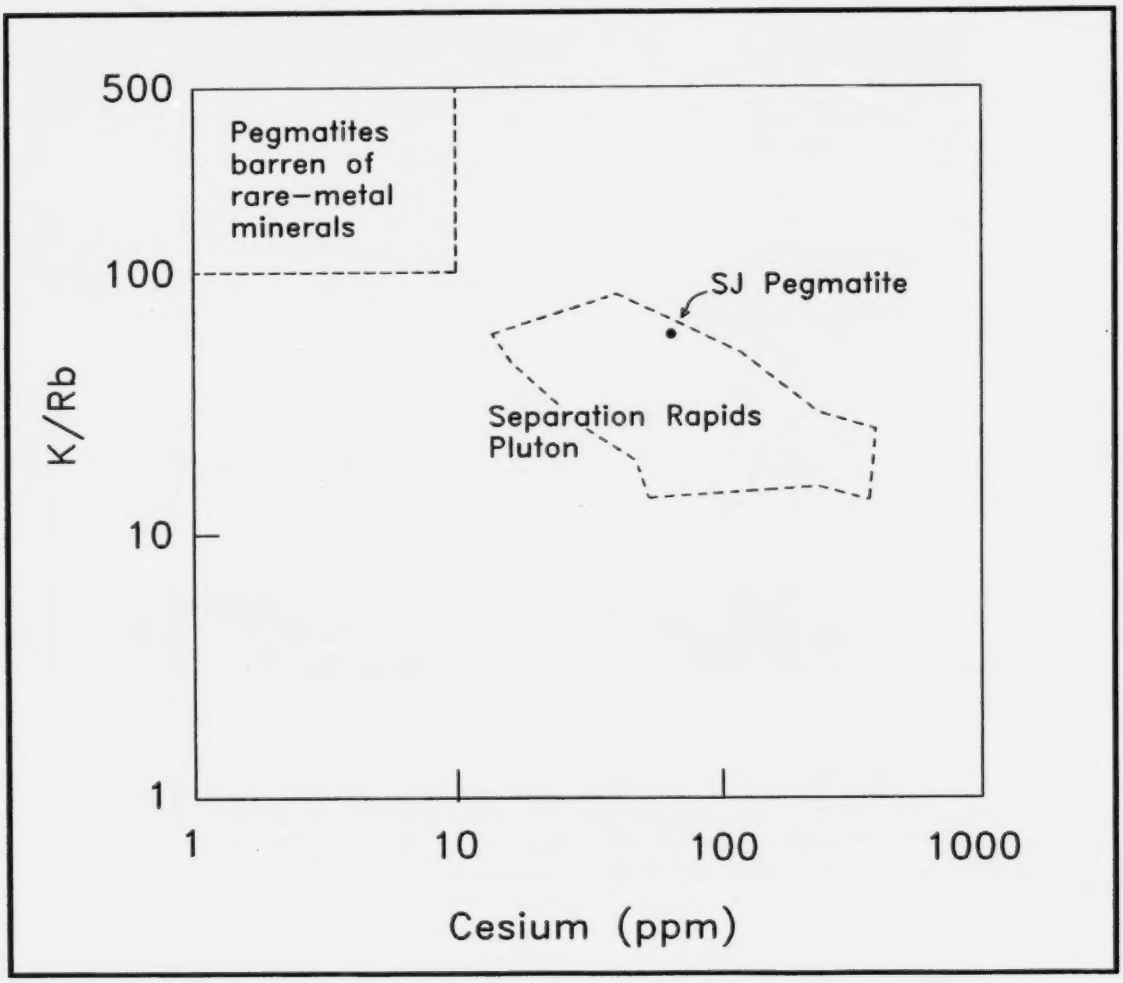

Figure 10. K/Rb versus Cs in potassium feldspar; basic figure *after* Breaks, Tindle and Smith (1999). Separation Rapids Pluton group included for comparison purposes.

RECOMMENDATIONS FOR EXPLORATION

Gold

The Killala–Baird batholith, the Walsh Lake and Cat Island plutons and parts of the Dome stock are late, magnetite-bearing felsic intrusions, spatially related to gold mineralization (Parker 2001). In particular, the >2.4 million ounce Madsen gold deposit is located within the high-temperature, calc-silicate metamorphic aureole of the Killala–Baird batholith and is interpreted (Dubé et al. 2000) to be a high-temperature disseminated-replacement-style deposit. Beakhouse (2001) has suggested a connection between late, oxidized, magnetite-bearing felsic intrusions and gold mineralization in the Hemlo greenstone belt. While more research is needed to further this idea in the Red Lake greenstone belt, the potential of similar deposit types should not be overlooked near the margins of late, oxidized, magnetite-bearing intrusions in the Confederation and Birch–Uchi belts.

A potentially new gold deposit type for the Red Lake belt has been encountered by Planet Explorations Inc. on their Sidace Lake property. Significant gold mineralization is hosted by sericite to quartz-sericite schist, with minor pyrite and quartz veinlets. The highest grade assay (97.03 g/t Au over 0.20 m in Hole RL-02-04) is hosted by a quartz vein with 11 ppm Hg and 2589 ppm Sb. Stibnite is encountered in some gold mineralized portions of the Campbell–Red Lake deposit, but is associated with mafic host rock.

Iron formation-hosted gold mineralization is known in both the Red Lake and Birch–Uchi greenstone belts. The McFinley Mine, now 100% controlled by Rubicon Minerals Corporation, has reported significant historical gold values in magnetite-chert iron formation. Redstar Gold Corp. controls the Newman–Heyson property in Todd Township, where previous work by Noranda Exploration Company Limited intersected gold mineralization, as high as 0.553 ounce per ton over 2.93 m, in magnetite-chert iron formation.

A number of gold-bearing, sulphidized chert-magnetite iron formations occur in the Keigat Lake area, in the northeastern Birch–Uchi greenstone belt. Some of the significant historical results from the Sandy Point, High Grade Island, Grimshaw and Dome–Keigat Creek occurrences were subject to ground investigations in 2002.

Diamonds

Thurston and Newsome (2002) present a predictive model for diamond-bearing rocks in Ontario. They conclude that specific structures, including Archean terrane boundaries, are spatially, and possibly genetically associated with kimberlites and alkaline magmatism. Recent tentative subdivisions of the northern Superior Province (Thurston 2002; Thurston and Newsome 2002) indicate favourable subprovince boundaries, one of which is known to be, at least spatially, associated with a carbonatitic intrusion (Carb Lake carbonatite; situated near the Ontario–Manitoba border, at approximately 54°45'N). Significant numbers of kimberlite indicator minerals were found in alluvium by OGS regional sampling (Stone 2001) in this Paleoarchean terrane (ca. 3500 Ma) north of 54° latitude.

Base Metals

Volcanogenic massive sulphide deposits and prospects, and associated proximal chloritic and alumino-silicate alteration, are well documented in the Red Lake and Confederation greenstone belts. Tribute Minerals Inc. and partner Noranda Inc. have successfully employed the TITAN-24 MT/IP system on their Dixie and Ben Lake properties. FII- and FIII-type rhyolites occur throughout a 100 km band stretching east from Red Lake to the past producing South Bay Mine (1.6 million tons grading 11.06% Zn, 1.8% Cu and 2.12 ounces Ag per ton). World-class deposits, such as the Mattabi and Geco, are associated with FII-type rhyolite; the Kidd Creek deposit is associated with FIII-type rhyolite. A heightened awareness now exists in the Red Lake District of the potential of discovery of a major base metal sulphide deposit.

Rare Metals

A group of previously unreported rare metal pegmatites have been described by Breaks, Selway and Tindle (2001) and in this volume from the Jubilee Lake area in Birkett Township. Pegmatitc rocks associated with the Allison Lake batholith in eastern Birkett Township form an attractive target for rare metal exploration. Breaks, Selway and Tindle (2001) also re-evaluated the McCombe pegmatite in the Root Lake area and found significant Ta mineralization. This result, as well as Ta values reported by Storey et al. (2000) also from the Root Lake area, indicate significant rare metal exploration potential in pegmatitic rocks hosted in mafic metavolcanics of the Uchi Subprovince north of the Lake St. Joseph fault. The area of interest includes the western and southern margins of the Allison Lake batholith; the eastern tail of the batholith that extends east-southeast from Birkett Township; and the pegmatites hosted in mafic metavolcanic rocks along the south margin of the Uchi Subprovince, proximal to the English River subprovince boundary.

Table 15. Rare metal pegmatite targets in the Red Lake District 2002.

Property/Deposit Name (Claim Sheet, NTS)	Owner	Geology/Mineralization	Assays
Uchi and English River Subprovinces:			
McCombe (Root Lake Area, 52J/13NE)	Patented Claims	highly fractionated pegmatite dikes hosted by mafic metavolcanics	2.3 million tons of 1.3% Li_2O (assessment files)
Consolidated Morrison (Root Lake Area, 52J/13NE)	H. A. Watt	spodumene reported from 4 pegmatites	2 samples 2.49% Li_2O and 5.91% Li_2O (assessment files)
Root Lake 5 Claim (Root Lake Area, 52J/13NE)	Patented Claims	spodumene reported from one diamond drill hole	
Root Lake 34 Claim (Root Lake Area, 52J/13NE)	P.V.English	beryl crystals up to 3 mm reported in two diamond drill holes	
Cramp Lake (Ear Falls Area, 52K/11NE)	Open	white muscovite-biotite-quartz-microcline pegmatite with anomalous Li (Storey 1990), exact location of original sample not known	
Sandy Creek Beryl (Camping Lake Area, 52K/11NW)	D.M. Crawford	pale yellow beryl in apatite-muscovite-quartz-albite replacement zones in pegmatite	0.8% Be in beryl bearing pegmatite (Blackburn et al 1999)
Massberyl Lithium Mines Ltd. (Whitemud Lake Area, 52K/15SW)	Open	fractionated pegmatite with anomalous lithium (Blackburn et al 1999)	
Valor Lithium Mines (Curie Lake Area, 52K/16NE)	Open	pale green beryl reported in drill core, pegmatite dikes hosted in rock interpreted to be intermediate metavolcanics and metasediments (assessment files)	
Curie Lake (Curie Lake Area, 52K/16NE)	Open	Light green beryl reported from tourmaline rich pegmatitic leucogranite (Breaks, Selway and Tindle 2001)	
Jubilee Lake Beryl (Jubilee Lake Area, 52N/01SW)	S.P. Johnson C.R. Girouard	Pale yellow beryl in 3 pegmatite dikes hosted by clastic metasediments and derived migmatites (Bateman 1940; Breaks, Selway and Tindle 2001)	

Property/Deposit Name (Claim Sheet, NTS)	Owner	Geology/Mineralization	Assays
North of 51:			
Pakeagama Lake (Pakeagama Lake Area, 53C/11SW)	Houston Lake Mining Inc.	complex type petalite subtype pegmatite with well developed internal zones	Channel sampling of the 13 metre wide Northern Wall Zone of the Pakeagama Lake pegmatite returned 344 g/t Ta_2O_5, 0.90% Rb_2O, 1776 g/t Cs_2O, 68.9 g/t Sn, 131.9 g/t Nb_2O_5, 1.34% Li_2O, 25.9 g/t Tl, and 42.2 g/t Ga over 11 metres.
Mattless Lake Beryllium (Setting Net Creek Area, 53C/12NE)	C.A. Colquhoun-Harper (Grand Rock Resources)	beryllium, zinc, molybdenite and bismuth reported by Stone, Crawford and Halstead (1993)	
Pennock Lake Holmquistite (Setting Net Creek Area 53C/12NE)	P.V. English	beryllium, zinc, molybdenite and bismuth reported by Stone, Crawford and Halstead (1993)	
Pennock Lake Spodumene (Setting Net Creek Area, 53C/12NE)	C.A. Colquhoun-Harper (Grand Rock Resources)	beryllium, zinc, molybdenite and bismuth reported by Stone, Crawford and Halstead (1993)	0.52% Li reported by Ayres (1972)
Favourable Lake (Favourable Lake North Area, 53C/13NW)	Open	coarse grained to pegmatitic muscovite-biotite granite (fertile granite)	Electron microprobe analysis carried out on samples from the property have identified tantalum minerals ferrotantalite and ferrocolumbite
Bearhead Lake Holmquistite (Setting Net Lake Area, 53C/13SE)	Open	holmquistite in granitoid rocks, reported by Stone, Fogal and Fitzsimon (1993)	

*Note: Updated as of February 11, 2003.

OGS ACTIVITIES AND RESEARCH BY OTHERS

There were 3 projects undertaken in the Red Lake District in 2002 (keyed to Figures 1 to 4). Two of these projects were by the Ontario Geological Survey (OGS); and one project was part of the Western Superior NATMAP (National Mapping Program) and a Geological Survey of Canada collaboration with partners.

A. J. Newsome of the Resident Geologist Program in collaboration with P.C. Thurston from Laurentian University's Mineral Exploration Research Centre (MERC), completed a predictive model for diamond-bearing rocks in Ontario; for use in the Provincially Significant Mineral Potential (PSMP) methodology for mineral resource assessments based mainly upon fault control (Thurston and Newsome 2002).

B. Ontario Mineral Exploration Technologies (OMET) Program approved Quantec Geoscience Ltd.'s proposal for a demonstration survey of the distributed acquisition MT/IP earth imaging technology. Quantec completed their survey in 2002 by using their Titan 24 Deep Earth Imaging MT/IP System, 3Dquest Process. The survey was used on 3 properties in the Red Lake District: Tribute Minerals Inc. VMS properties - Dixie Lake and Ben Lake, and Goldcorp Inc.'s Red Lake Mine. The technology is designed to detect mineralization to depths of 1000 m in areas of glacial cover (Rayner, Lafleur-Roy and Fyon 2002).

The following study was part of the Western Superior NATMAP program:

C. B. Dubé of the Geological Survey of Canada (GSC), and K. Williamson from the University of Quebec's (INRS) research branch, and in collaboration with Goldcorp Inc., completed a third year of field work at the Red

Lake Mine for a four-year study for contribution to the Western Superior NATMAP program. Work focussed on mapping in detail a large stripped outcrop near the No.1 shaft of the former Cochenour–Willans Mine and other surface exposures and stripped outcrops within the Red Lake Mine Trend. More detailed mapping was also completed at the Red Lake Mine.

Results of the field work have been published (Dubé, Williamson and Malo 2003) describing the geology of the gold mineralization in the Cochneour–Willans Mine area with a discussion of its significance at the scale of the Red Lake Mine Trend. A detailed map, at a scale of 1:150, accompanying a series of photographs of the Cochenour–Willans stripped outcrop will be published as a GSC Open File (Williamson and Dubé *in press*) (B. Dubé, written communication, 2003).

Table 16. Publications received by the Red Lake Office in 2002.

Title	Author	Type and Year of Publication
Precambrian Geology of the Coldwell Alkalic Complex	E.C. Walker, R.H. Sutcliffe, C.S.J. Shaw, G.T. Shore and R.S. Penczak	OGS, Open File Report 5868, 1993
Report of Activities 2001, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	A. Lichtblau, P. Hinz, C. Ravnaas, C.C. Storey, L. Kosloski and A. Raoul	OGS, Open File Report 6079, 2002
Report of Activities 2001, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	J.K. Mason, G.D. White, J.F. Scott, M.S. O'Brien and C. Komar	OGS, Open File Report 6080, 2002
Report of Activities 2001, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	B.R. Schnieders, J.F. Scott, M.C. Smyk, D.P. Parker and M.S. O'Brien	OGS, Open File Report 6081, 2002
Report of Activities 2001, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	B.T. Atkinson, M. Hailstone, G. Wm. Seim, D.M. Draper, D. Farrow and P. Hope	OGS, Open File Report 6082, 2002
Report of Activities 2001, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts	G. Meyer, M. Cosec, G.P.B. Grabowski, D.L. Guindon, E.C. Chaloux and J.M. Stewart	OGS, Open File Report 6083, 2002
Report of Activities 2001, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre, and Petroleum Resources Centre	P.J. Sangster, W.J. McGuinty, V.C. Papertzian, K.G. Steele, C.R. Lee, D.A. Laidlaw, M. Barua, T.R. Carter and B.D. Parkes	OGS, Open File Report 6084, 2002
Report of Activities 2001, Resident Geologist Program, Regional Land Use Geologist Report: Northwestern, Northeastern and Southern Ontario Regions	R.L. Debicki, A.P. Drost, D.J. Rowell and G.R. Yule	OGS, Open File Report 6085, 2002
Perrault Falls Area High Density Regional Lake Sediment Geochemical Survey, Northwestern Ontario: Operation Treasure Hunt	Ontario Geological Survey	OGS, Open File Report 6092, 2002
Summary of Field Work and Other Activities 2002	Edited by C.L. Baker, E.J. Debicki, R.I. Kelly and J.R. Parker	OGS, Open File Report 6100, 2002
Precambrian Geology Compilation Series, Schreiber Sheet	F. Santaguida	OGS, Map, 2665 - Revised, 2002
Precambrian Geology Compilation Series, White River Sheet	F. Santaguida	OGS, Map, 2666, 2001

Title	Author	Type and Year of Publication
Geology and Tectonostratigraphic Assemblages, Western Wabigoon Subprovince, Ontario	M. Sanborn-Barrie, T. Skulski, J.A. Percival, J.B. Whalen, J.L. Brown and V. McNicoll	OGS, Preliminary Map, P.3446, 2002 GSC Open File 4255, 2002
Geology and Tectonostratigraphic Assemblages, North Central Wabigoon Subprovince, Ontario	J.A. Percival, J.B. Whalen, K.Y. Tomlinson, V. McNicoll and G.M. Stott	OGS, Preliminary Map, P.3447, 2002 GSC Open File 4270, 2002
Geology and Tectonostratigraphic Assemblages, South-Central Wabigoon Subprovince, Ontario	D. Stone, K.Y. Tomlinson, D.W. Davis, P. Fralick, J. Hallé, J.A. Percival and P. Pufahl	OGS, Preliminary Map, P.3448, 2002 GSC Open File 4284, 2002
Geology and Tectonostratigraphic Assemblages, Eastern Wabigoon Subprovince, Ontario	G.M. Stott, D.W. Davis, J.R. Parker, K.J. Straub and K.Y. Tomlinson	OGS, Preliminary Map, P.3449, 2002 GSC Open File 4285, 2002
Satellite Image Map, Opasquia Lake area northwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3464, 2002
Satellite Image Map, Opasquia Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3465, 2002
Satellite Image Map, Makoop Lake area northwest, northwestern Ontario	V.H Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3466, 2002
Satellite Image Map, Makoop Lake area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3467, 2002
Satellite Image Map, Opasquia Lake area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3472, 2002
Satellite Image Map, Opasquia Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3473, 2002
Satellite Image Map, Makoop Lake area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3474, 2002
Satellite Image Map, Makoop Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3475, 2002
Satellite Image Map, Asheweig River area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3476, 2002
Satellite Image Map, Asheweig River area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3477, 2002
Satellite Image Map, Winiskisis Channel area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3478, 2002
Satellite Image Map, Deer Lake area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3479, 2002
Satellite Image Map, North Spirit Lake area northwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3480, 2002
Satellite Image Map, North Spirit Lake area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3481, 2002
Satellite Image Map, North Caribou Lake area northwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch, and S.J. Leney	OGS, Preliminary Map, P.3482, 2002
Satellite Image Map, North Caribou Lake area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch, and S.J. Leney	OGS, Preliminary Map, P.3483, 2002
Satellite Image Map, Deer Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3487, 2002
Satellite Image Map, North Spirit Lake area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3488, 2002
Satellite Image Map, North Spirit Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3489, 2002

Title	Author	Type and Year of Publication
Satellite Image Map, North Caribou Lake area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3490, 2002
Satellite Image Map, North Caribou Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3491, 2002
Satellite Image Map, Carroll Lake area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3495, 2002
Satellite Image Map, Trout Lake area northwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3496, 2002
Satellite Image Map, Trout Lake area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3497, 2002
Satellite Image Map, Lake St. Joseph area northwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3498, 2002
Satellite Image Map, Lake St. Joseph area northeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3499, 2002
Satellite Image Map, Carroll Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3503, 2002
Satellite Image Map, Trout Lake area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3504, 2002
Satellite Image Map, Trout Lake area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3505, 2002
Satellite Image Map, Lake St. Joseph area southwest, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3506, 2002
Satellite Image Map, Lake St. Joseph area southeast, northwestern Ontario	V.H. Singhroy, P.J. Barnett, P. Assouad, K. Molch and S.J. Leney	OGS, Preliminary Map, P.3507, 2002
Precambrian Geology, Yelling Lake area	D. Stone and J. Hallé	OGS, Preliminary Map, P.3518, 2002
Magmatic Ni-Cu ± PGE Occurrences and Mafic-Ultramafic Bodies in Ontario	L. Hulbert and C. Vaillancourt	OGS, Miscellaneous Release—Date 100, 2002
Lake Sediment Geochemical Data from the Perrault Falls Survey Area, Northwestern Ontario: Operation Treasure Hunt	Ontario Geological Survey	OGS, Miscellaneous Release—Date 106, 2002
Electron Microprobe and Bulk Analyses of Fertile Peraluminous Granites and Related Rare-Element Pegmatites, Superior Province, Northwest and Northeast Ontario: Operation Treasure Hunt	A.G. Tindle, J.B. Selway and F.W. Breaks	OGS, Miscellaneous Release—Date 111, 2002
Lithogeochemical Data from the Red Lake Greenstone Belt, Northwestern Ontario	J.R. Parker	OGS, Miscellaneous Release—Date 113, 2002
Geological and Lithogeochemical Data from Mafic-Ultramafic Bodies in Ontario as a Guide to Exploration for Platinum Element (PGE) Deposits: Operation Treasure Hunt	C. Vailliancourt, R.A. Sproule, C.A. MacDonald and P.A. Takats	OGS, Miscellaneous Release—Date 115, 2002
Geology of the Goldcorp Inc. High Grade Zone, Red Lake Mine, Ontario: An Update	B. Dubé, K. Williamson and M. Malo	GSC, Current Research 2002-C26, 2002
Preliminary Fluid-Inclusion Microthermometry Study of Fluid Evolution and Temperature-Pressure Conditions in the Goldcorp High-Grade Zone, Red Lake Mine, Ontario	G. Chi, B. Dubé, and K. Williamson	GSC, Current Research 2002-C27, 2002
Whole-rock chemical analyses from the Birch-Uchi greenstone belt, Superior Province	N. Rogers	GSC, Open File 4271, 2001

Title	Author	Type and Year of Publication
Geology, Confederation Lake, Ontario	N. Rogers	GSC, Open File 4265, 2002
Database for CAMIRO Project 94E07: Interrelationships Between Subvolcanic Intrusions, large-scale Alteration Zones and VMS Deposits	A. Galley, A. Bailes, M. Hannington, G. Holk, J. Katsube, F. Paquette, S. Paradis, F. Santaguida and B. Taylor. Compiled by B. Hillary	GSC, Open File 4431, 2002
The Geology, Geochemisty, Mineralogy and Mineral Beneficiation of Platinum-Group Elements	Edited by Louis J. Cabri	CIM, Special Volume 54, 2002
2001 Western Superior Transect Seventh Annual Workshop	R.M. Harrap and H.H. Helmstaedt	Lithoprobe Secretariat, University of British Columbia, 2001
Provincial Geologists Journal 2001		Committee of Provincial Geologists, Volume 19, 2001

Table 17. Mineral deposits not being mined in the Red Lake District in 2002.

Abbreviations

AF.....Assessment Files
CMH.....Canadian Mines Handbook
GR.....Geological Report
MDC.....Mineral Deposit Circular
MDIR.....Mineral Deposit Inventory record
MLS.....Mining Lands, Sudbury
MR.....Mining Recorder
NM.....The Northern Miner
OFR.....Open File Report
PC.....Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Abino Bateman, Balmer and Dome Townships (52N/04SW)	Au	Total Granodiorite Zone drill indicated tonnage 405 162 tons 0.203 opt Au from three sub-zones (McClean 1976)	Goldcorp Inc.	AF	Patent
Aiken-Russet Baird Township (52K/13NW)	Au	Total reserves of 102 555 tons of 0.22 opt Au	Claude Resources Inc.	AF	Patent
Alcourt (Copper Man, Hanson-Campbell) Fairlie Township (52N/04SW)	Au	Reserves: 20 000 tons of 0.45 opt Au (Tilsley 1981) from 1959-60 diamond drilling No. 1 vein - 17 000 tonnes of 0.2429 oz per tonne Au (Tilsley 1981) from 1959-60 diamond drilling and 1981 sampling program	Unknown	AF	Patent
Annco Mine Dome Township (52N/04SW)	Au	Reserves: 50 000 tons of "Excellent Grade" (0.35 opt Au?)	Goldcorp Inc.	OFR Energy Mines and Resources Canada 1989	Patent
Bathurst Mine Skinner Township (52N/07SW)	Au	Reserves: 80 000 tons of 0.587 opt Au	Sabina Resources Ltd.	Energy Mines and Resources Canada 1989	Leased

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Berens River Mine (Golsil, Zahavy) (53C/13SE)	Au, Ag, Pb, Zn	Reserves: No. 1 Zone - 75 000 tons of 0.1 - 0.2 opt Au, 4.0 – 5.0 opt Ag No. 3 Zone - 982 213 tons of 0.26 opt Au, 4.8 opt Ag, 0.77% Pb, 1.12% Zn (713 249 tons indicated, 268 964 tons inferred) at 0.15 opt Au cut-off to 750 metre level	Anaconda Gold Corp.	MDIR AF - (Bevan, 1983)	Staked Claim
Bluffy Lake (52K/14SE)	Fe	Reserves: 21 000 000 tons at 22.86% Fe	Unknown	Prelim. Map P.1199	Licence of Occupation
Borland Lake (53D/16NE)	Ag, Au	Probable Reserves: 502 412 tons of 8.09 opt Ag and 0.02 opt Au	Crown	Massive Resources Ltd. Preliminary Prospectus - August 6, 1987	Open
Buffalo Red Lake Heyson Township (52N/04SW)	Au	Reserves: 421 728 tonnes of 0.139 opt Au drill indicated in 1980	Claude Resources Inc.	MDIR	Patent
Cochenour–Willans Mine Dome Township (52N/04SW)	Au	Reserves: Proven and probable 173 000 tons of 0.51 opt Au, possible reserves 274 000 tons of 0.59 opt Au	Goldcorp Inc.	NM - Dec. 12, 1994 p.7	Patent, Licence of Occupation
Cole Goid Mine Ball Township (52M/01SE)	Au	Reserves: 119 780 tons of 0.41 opt Au probable and indicated (Wilton, 1973)	The Cole Gold Mines Ltd.	AF	Patent, Licence of Occupation
Consolidated Marcus Dome Township (52N/04SW)	Au	Reserves: 60 000 tons of 0.18 opt Au	Goldcorp Inc.	Energy Mines and Resources Canada 1989	Patent
Copper Lode A – Rexdale Group Prospect (52K/15NW)	Cu, Ag	Reserves: 236 424 tons of 1.94% Cu, 1.22 opt Ag or 425 612 tons of 1.56% Cu, 0.98 opt Ag or 854 007 tons of 1.01% Cu, 0.57 opt Ag	P. English	AF MP152	Staked Claim
Copper-Lode D Belanger Township (52K/15NW)	Cu, Zn	Reserves: 36 000 tons of 0.26% Cu, 7.58% Zn	Tribute Minerals Corporation	AF	Leased
Copper-Lode E Belanger Township (52K/15NW)	Cu, Ag	Reserves: 160 000 tons of 8.28% Zn, 1.02% Cu, 0.39 opt Ag	Tribute Minerals Corporation	AF	Leased
Dixie Creek (52K/13SE)	Au	Reserves: 417 000 tons of 0.126 opt Au	Perry English	AF	Staked Claim
Dixie 3 Prospect (52K/14NW)	Cu, Zn	Reserves: 91 000 tons of 10.0% Zn, 1.0% Cu	Tribute Minerals Corporation	AF	Leased - Mining Rights Only, Staked Claim
Dixie 18 Prospect (52K/14NW)	Zn	Reserves: 110 000 tons of 0.5% Cu, 12.5% Zn	Tribute Minerals Inc.	AF	Staked Claim

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Grassett Prospect Earngey Township (52N/02SE)	Au	Reserves: 78 295 tons of 0.22 opt Au (Part of the Hill-Sloan-Tivy Vein)	Lac Properties Inc.	Energy Mines and Resources Canada 1989	Patent
Griffith Mine (52K/14SW)	Fe	Reserves: 120 000 000 tons of 29% Fe	Crown	GR82	Withdrawn from staking
Hasaga Mine Heyson Township (52N/04SW)	Au	Reserves: C Block (below 1800 feet) - 200 203 tons of 0.192 opt Au Stopes - 41 430 tons of 0.104 opt Au Pillars - 6 365 tons of 0.134 opt Au	Lac Properties Inc.	GR56	Patent
Hill-Sloan-Tivy Earngey Township (52N/02SE)	Au	Reserves: 296 000 tons of 0.219 opt Au (Grassett Prospect Reserves may be included in total)	Lac Properties Inc.	AF	Patent
Horseshoe Island (52N/08NW)	Au	Reserves: 893 508 tons of 0.14 opt Au	Masuparia Gold Corp. & Red Lake Resources	Northwest Prospector, March/April 1990, p.27	Staked Claim
Howey Mine Heyson Township (52N/04SW)	Au	Reserves: 780 000 tons of 0.08 opt Au	Teck Corporation	Energy Mines and Resources Canada 1989	Patent, Licence of Occupation
Jackson-Manion Mine Dent Township (52N/02SE)	Au	Reserves: 40 000 tons of 0.5 opt Au	Central Asia Goldfields Corporation	NM - March 14, 1985, p.21	Patent
Joy - New Zone (Diamond Willow Zone, Creek Zone) (52K/14NW)	Cu, Zn	Reserves: 300 000 tons of 4% combined Cu-Zn	Tribute Minerals Corporation	AF	Staked Claim
Kesaka Lake (52K/16NW)	Fe	Reserves: 312 500 000 tons of 31.1% Fe to a depth of 100 feet	Crown	ODM Annual report Vol. 48, pt. 8, p. 1-43	Open
Laverty (Thrall) Heyson Township (52N/04SW)	Au	Reserves: Speculative reserves from the Diabase dike zone: - 329 000 tons of 0.08 opt Au or 75 000 tons of 0.15 opt Au	Goldcorp Inc.	AF	Patent
Lingman Lake (53F/15SW)	Au	Reserves: 1 172 753 tons of 0.20 opt Au in all zones at 5.0 foot minimum width and a cut-off grade of 0.08 opt Au (McPhee, 1989)	Cool Minerals Inc.	AF	Patent
May-Spiers Ball Township (52M/01SE)	Au	Reserves: 30 000 tons of 0.09 opt Au	Goldcorp Inc.	AF	Staked Claim

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
McCombe (Root Lake) (52J/13NE)	Lithia	Reserves: 2.3 million tons of 1.3% Lithia to the 500 foot level	Unknown	MP90	Patent, Licence of Occupation
McFinley Mine Bateman Township (52N/04SE)	Au	Inferred Mineral Resource: 334,007 *in situ* at an average grade of 0.20 opt Au to a depth of 400 feet Broke down as follows: FWC-3 Zone - 3 875 tons of 0.50 opt Au C Zone - 10 520 tons of 0.87 opt Au FWC-1 + 2 - 30 600 tons of 0.24 opt Au C-2 Zone -128 700 tons of 0.11 opt Au C-3 Zone -36 562 tons of 0.19 opt Au WL Zone -10 500 tons of 0.49 opt Au 403 Zone -5 000 tons of 0.80 opt Au BX Zone -2 000 tons of 0.84 opt Au D Zone -106 250 tons of 0.15 opt Au Resource Estimate: 890 000 tons at an in-place grade of 0.19 opt Au to a depth of about 1700 ft	Rubicon Minerals Corporation	AF	Patent, Licence of Occupation
Mount Jamie Todd Township (52M/01SE)	Au	Reserves: Main Zone - 47 048 tons of 0.425 opt Au No. 2 Shaft area - 25 360 tons of 0.37 opt Au	Jamie Frontier Resources Inc.	AF	Patent
My-Ritt (Coin Lake) Heyson Township (52N/04SW)	Au	Unknown	Wolfden Resources Inc.	OFR 5558	Patent
New Faulkenham Mines Ltd. (Faulkenham Lake) Baird Township (52K/13NW)	Au	Reserves: 15 000 tons of 0.428 opt Au ($15.00 at $35.00 per ounce Au - Holbrooke, 1958)	Claude Resources Inc.	AF	Patent
North Spirit Lake (Crown Trust) (53C/07NW)	Fe	Reserves: 1.3 million tons per vertical foot of 33.94% Fe	Unknown	ODM Annual Report Vol.47, Pt. 7, p.44-78 GR150	Patent, Leased
Northgate Prospect Earngey Township (52N/02SE)	Au	Reserves: 64 600 tons of 0.28 opt Au	P. English	AF	Staked Claim
Ogani Lake (52K/15NE)	Fe	Reserves: 100 000 000 tons of 21.6% Fe	Crown	AF	Open

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Papaonga Lake (52K/16NE)	Fe	Reserves: 13 500 000 tons of 31.06% Fe	Crown	MDIR	Open
Red Crest (Red Summit) Todd Township (52M/01SE)	Au	Reserves: 47 439 tons of 0.269 opt Au (uncut grade) - Horwood, 1945 38 000 of 0.3 opt Au	Claude Resources Inc.	NM - March 14, 1985, p.21 DoM Annual Report vol. 49, pt. 2, 1940	Patent
Redaurum Baird Township (52N/04SW)	Au	Possible Reserves: 14A Zone - 243 750 tons of 0.22 opt Au - 26 250 tons of 0.20 opt Au No. 2 Zone - 137 500 tons of 0.18 opt Au No. 3 Zone - 102 500 tons of 0.18 opt Au Camp Zone - 24 750 tons of 0.13 pt Au	Sabina Resources Ltd. (80%) and Redaurum Ltd. (20%)	AF	Patent
Richardson (Kostynuk Bros. Mine) (52N/09SW)	Au	Reserves: 700 000 tons of 0.2 opt Au inferred reserves	Unknown	OFR 5835	Patent
Rowan Todd Township (52M/01SE)	Au	Reserves: 10 900 tons of 0.657 opt Au ($23.00 a ton at $35.00 per ounce)	Goldcorp Inc.	AF	Patent
Sanshaw (Whitehorse Island) Dome Township (52N/04SW)	Au	Reserves: 175 000 tons of 0.20 opt Au	Wolfden Resources Inc.	NM - June 11, 1953	Patent, Licence of Occupation
Setting Net Lake (53C/13SE)	MoS_2	Reserves: 100 000 000 tons of 0.09% MoS2	Crown	MDIR NM - March 23, 1973	Open
Sol-D'Or Honeywell Township (52N/07SE)	Au	Reserves: 8 565 tons of 0.57 opt Au	P. English	Energy Mines and Resources Canada 1989	Staked Claim
Springpole Lake Prospect (52N/08NW)	Au	Reserves: Portage Zone - 7.9 million tons of 0.07 opt Au - 27 million tons of 0.035 opt Au including 4 million tons of 0.091 opt Au and 405 000 tons of 0.14 opt Au	Gold Canyon Resources Inc.	OFR 5835	Patent, Staked Claims
Starratt-Olsen Mine Baird Township (52K/13NW)	Au	Reserves: 15 000 tons of 0.45 opt Au	Claude Resources Inc.	NM - July 26, 1973 MDIR	Patent

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Trout Bay Zinc Pit Zone Mulcahy Township (52M/01SE)	Zn, Cu, Pb, Ag, Au	Reserves: West Zone - 13 776 tons of 4.75% Zn, 0.68% Cu, 0.94 opt Ag East Zone - 124 760 tons 7.86% Zn, 1.5% Cu, 0.24% Pb, 1.7 opt Ag, 0.007 opt Au	Goldcorp Inc.	MP147 Prelimary Map P.567 MDIR	Patent (Mining Rights Only), Leased (Mining Rights Only, Licence of Occupation
Uchi Mine Earngey Township (52N/02SE)	Au	Reserves: 214 000 tons of 0.147 opt Au	Lac Properties Inc.	Energy Mines and Resources Canada 1989	Patent
Wilmar Mine Dome Township (52N/04SW)	Au	Reserves: Quoted from Durocher et al 1987 unless indicated otherwise Diorite Dike Zone - 140 000 tons of 0.21 opt Au East Breccia Zone - 31 500 tons of 0.32 opt Au (Proven) - 50 500 tons of 0.25 opt Au (Probable) - 1 777 000 tons of 0.24 opt Au (Possible) Carbonate Zone - 25 000 tons of 0.17 opt Au (Probable) - 7 500 tons of 0.15 opt Au (Possible) West Granodiorite Zone - 3.15 to 4.5 million tons of 0.076 to 0.131 opt Au (EMR Canada, 1989) Granodiorite Zone - 5 700 000 tons of 0.10 to 0.15 opt Au	Goldcorp Inc.	OFR 5558 Energy Mines and Resources Canada 1989	Patent
Woco Vein Earngey Township (52N/02SE)	Au	Reserves: 21 263 tons of 0.80 opt Au	St. Jude Resources Ltd.	AF	Staked Claims
Young, H.G. Mines Ltd. Balmer Township (52N/04SW)	Au	Reserves: 270 000 tons of 0.31 opt Au	Placer Dome North America	OFR 5558	Patent

*Note: This table contains tonnage and grade estimates referred to as reserves (indicated, possible, probable) which were determined at various times by methods largely unreported. None of these estimates are known to conform to the standards required for NI 43-101. All should be considered inferred mineral resources not reserves.

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Red Lake Regional Resident Geologist (Kenora District)—2002

by

C. Ravnaas, A. Raoul and S. Wilson

2003

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RED LAKE REGIONAL RESIDENT GEOLOGIST (KENORA DISTRICT)—2002

C. Ravnaas[1], A. Raoul[2] and S. Wilson[3]

[1] District Geologist, Kenora District, Resident Geologist Program, Ontario Geological Survey

[2] Acting District Geologist, Kenora District, Resident Geologist Program, Ontario Geological Survey

[3] Acting District Support Geologist, Kenora District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

Dimension, monument and decorative stone continued to be produced and marketed from 4 quarries in the Kenora District in 2002. No metallic mineral production was recorded in the district. A total of 16 companies and 12 prospectors conducted mineral exploration and prospecting programs on 38 properties in the district. Avalon Ventures Ltd. and Emerald Fields Resource Corp. continued advanced market analysis projects on their Separation Rapids rare-metal projects. The number of exploration projects per commodity were as follows: gold 19, rare-metals 6, platinum group metals 5, base-metal 4, dimension, monument and decorative stone 3 and industrial minerals 1.

MINING ACTIVITY

Production continued from 4 granite quarries. The quarries mentioned below are keyed, with letters in parentheses, to Figure 2.

Dimension and Monument Stone

NELSON GRANITE LTD. (A DIVISION OF GRANITE MONUMENTS LTD.)

Nelson Granite Ltd. continued year-round production from 4 stone quarries in the Kenora District, during 2002. Production figures for the 4 quarries are as follows: 8830 m^3 (311 841 ft^3) of "Vermilion Pink" from the Vermilion Bay Quarry (A); 3183 m^3 (112 422 ft^3) of "Pine Green and Crystal Gold" from the Forgotten Lake East Quarry (B); 485 m^3 (17 173 ft^3) of "Red Deer Brown" stone from the Red Deer Lake Quarry (C); and 162 m^3 (5729 ft^3) of stone marketed under the name "Shepody" was produced from the Shepody Quarry (D) (Nelson Granite Ltd., personal communication, January 2003).

Table 1. Assessment files received in the Kenora District in 2002.

Abbreviations

AEM	Airborne electromagnetic survey	Lc	Linecutting
AM	Airborne magnetic survey	Met	Metallurgical testing
ARA	Airborne radiometric survey	OD	Overburden drilling
Beep	Beep Mat survey	ODH	Overburden drill hole(s)
Bulk	Bulk sampling	OMIP	Ontario Mineral Incentive Program
DD	Diamond drilling	OPAP	Ontario Prospectors Assistance Program
DDH	Diamond drill hole(s)	PEM	Pulse electromagnetic survey
DGP	Down-hole geophysics	PGM	Platinum group metals
GC	Geochemical survey	Pr	Prospecting
GEM	Ground electromagnetic survey	RES	Resistivity survey
GL	Geological survey	Samp	Sampling (other than bulk)
GM	Ground magnetic survey	Seismic	Seismic survey
GRA	Ground radiometric survey	SP	Self potential survey
Grav	Gravity survey	Str	Stripping
HLEM	Horizontal loop electromagnetic survey	Tr	Trenching
HM	Heavy mineral sampling	UG	Underground exploration/development
IM	Industrial mineral testing and marketing	VLEM	Vertical loop electromagnetic survey
IP	Induced polarization survey	VLFEM	Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation	
Aubrey Township	Champion Bear Resources Ltd.	1995	DD 26-5295m, Samp	Non-Assess	52F14SE	E-5
Bad Vermilion Lake Area	Ed-Vic Exploration Ltd	1978	GL, Samp	Non-Assess	52C10NE	Z-5
Bad Vermilion Lake Area	Hexagon Gold Ontario Ltd.	2002	Samp	2.23614	52C10NE	HHH-2
Bad Vermilion Lake Area	Stephana Resources Ltd	2001	GC, GL	2.21833	52C10NE	GGG-3
Bluffpoint Lake Area	Fairservice, Robert	2002	GL, Samp	2.24287	52F03NW	X-1
Boyer Lake Area	Goldeye Explorations Ltd.	2001	Samp	2.22313	52F07NE	III-5
Boyer Lake Area	Goldeye Explorations Ltd.	2002	GM, Lc	2.24025	52F07NE	III-6
Boyer Lake Area	McAteer, W.	2001	GC, Samp	2.23701	52F07NE	ZZ-3
Brownridge Township	Emerald Fields Resource Corporation	2002	DD 3-182.5	2.24502	52F15SE	GG-1
Code Township	Etherington, Robert	2001	Pr, GL, Samp	2.23003	52E09SE	EE-4
Code Township	Etherington, Robert	2001	Pr, GL, Samp	2.23004	52E09SE	EE-5
Code Township	Pogson, Gordon	2001	GL, Samp	2.21559	52E09SE	S-9

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Code Township	Pogson, Gordon	2001	GL, Pr, Samp	2.23737	52E09SE S-10
Contact Bay Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23170	52F10NW AAA-2
Contact Bay Area	Atikwa Minerals Ltd.	2001	GL,Samp	2.23076	52F10NW AAA-4
Contact Bay Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23074	52F10NW AAA-5
Contact Bay Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23078	52F10NW AAA-3
Contact Bay Area	Atikwa Minerals Ltd.	2001	Pr, GL, Samp	2.21725	52F10NW AAA-1
Dogpaw Lake Area	Twomey, T.J.	2001	GL, Str, Samp	2.22338	52F05SW DDDD-6
Eagle Rock Lake Area	Champion Bear Resources Ltd.	2001	DD 23-3083m, Lc, Pr, GL, Samp	2.23304	52F02NE D-4
Echo Township	Glatz, A. & Riives, J.	2001	Pr, GM, GEM, GL, Samp	2.22921	52F16NW -0100
Forgotten Lake Area	Nelson Granite Ltd.	2001	DD 4-27.3m, Samp	2.22628	52L01SW E-12
Goshawk Lake Area	Nelson Granite Ltd.	2001	DD 1-12.1m, Samp	2.22637	52L02NW C-1
Halkirk Township	Cousineau, Louis	2001	Pr, Str, GL, Samp	2.22941	52C11NE G-7
Halkirk Township	Cousineau, Louis	2001	Pr, Str, GL, Samp	2.22779	52C10NW U-15
Halkirk Township	Cousineau, Louis	2001	Pr, GL, Samp	2.22967	52C10NW U-16
Halkirk Township	Minnova Inc	1984-89	GL, Pr, Str, Samp	Non-Assess	52C10NW Y-6
Halkirk Township	Northern Crown Mines Ltd.	2001	GL, Pr, GL, Samp	2.21620	52C11NE ZZ-1
Harper Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23082	52F07NW O-1
Le May Township	Pogson, Gordon	2000	Pr, GL, Samp,	2.23338	52E09NE C-4
Line Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23070	52F11SW S-2
Line Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23061	52F11SW S-1
Line Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23029	52F11SW S-3
Patterson Lake Area	Avalon Ventures Ltd.	1997	Pr, GL, Samp	2.22312	52L07SE R-3
Patterson Lake Area	Avalon Ventures Ltd.	2001	DD 12-1401m, Samp	2.22313	52L07SE R-4
Patterson Lake Area	Champion Bear Resources Ltd.	2001	Sr, GL, Samp	2.22140	52L07SE M-10

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Patterson Lake Area	Emerald Fields Resource Corporation	1999	DD 18-2097m, Samp	2.22913	52L07SE S-6
Patterson Lake Area	Tantalum Mining Corp. Ltd.	2000-01	DD 3-722m, GL, Samp	2.22278	52L07SE Q-7
Raleigh Lake Area	Avalon Ventures Ltd.	2000	GL, Str, GC, Samp	2.21766	52G05NW K-3
Raleigh Lake Area	Avalon Ventures Ltd.	2001	DD 4-752m, GL, Tr, Samp	2.22429	52G05NW K-4
Revell Township	Fairservice, Robert	2001	GC,GL	2.22131	52F09SE S-3
Rex Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23168	52L07NE V-3
Rex Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23163	52L07NE V-2
Rex Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23073	52L07NE V-1
Reynar Lake Area	Atikwa Minerals Ltd	2001	GL, Samp	2.23167	52L06NE X-1
Reynar Lake Area	Atikwa Minerals Ltd.	2001	AM, AEM	2.23461	52L06NE X-2
Shoal Lake Area	Forester Resources Inc.	1987	GL	Non-Assess	52E10SW BBB-1
Shoal Lake Area	Nu-Start Resources Corporation	1987	GL	Non-Assess	52E10SW AAA-1
Snowshoe Bay Area	I.R. 39	1976	GL, GM	Non-Assess	52E11SE R-1
Tabor Lake Area	Cantera Mining Limited	2002	AM, GL	2.23864	52F09SW EE-1
Treelined Lake Area	Champion Bear Resources Ltd.	2001	DD 9-1074m, Samp	2.2303	52L08SW K-12
Treelined Lake Area	Kuehnbaum, R. & Zebruck, G.	2002	GL	2.22903	52L08SW M-3
Turtlepond Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23081	52F10SE LL-1
Werner Lake Area	Atikwa Minerals Ltd.	2001	GL, Samp	2.23164	52L07NW U-1
Zealand Township	Houston Lake Mining Inc.	2002	Lc, GM, VLFEM	2.24234	52F15SW FF-1

EXPLORATION ACTIVITY

Assessment work received is listed in Table 1. During 2002, claim acquisition in the Kenora District targeted historical gold areas, including the Sturgeon, Minnitaki and Dogpaw lake areas. All historical gold areas in the district as of December 31, 2002, still have open Crown land; there is potential for additional staking activity and mineral exploration in 2003. Distribution of unpatented claims in the Kenora District is presented in Figure 3.

Successful gold exploration programs by Houston Lake Mining Inc. and Metalore Resources Ltd. in the Dogpaw–Rowan lakes area generated a considerable amount of claim staking activity on adjacent ground. Figure 3 illustrates claim distribution in the area. The locations of gold occurrences targeted by these two projects, plus other occurrences and undeveloped prospects in the area, are also illustrated in Figure 1.

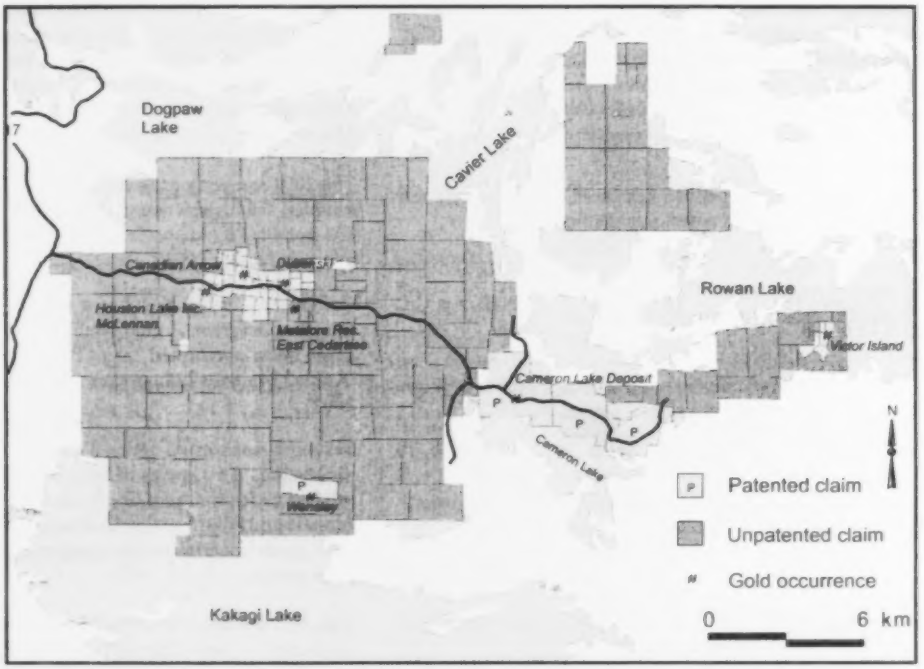


Figure 1. Claim activity in the Dogpaw–Rowan lakes area as of December 31, 2002.

A complete summary of exploration activity, including prospecting, is presented in Table 2. Gold, rare-metal pegmatites, platinum group elements and building stone were the predominant target commodities in 2002. Programs are keyed with numbers in Table 2 to Figure 2.

Table 2. Exploration activity in the Kenora District in 2002.

Abbreviations

AM ..... Airborne magnetic survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
Lc ..... Linecutting
Met ..... Metallurgical testing
Pr ..... Prospecting
Samp ..... Sampling (other than bulk
Str ..... Stripping
Tr ..... Trenching
VLFEM ..... Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence or Property)	Exploration Activity	Commodity	Activity
1	Atikwa Minerals Ltd. (Mulcahy Gabbro Property)	GL, Pr, Samp	PGE, Au,Cu, Ni	Stripping and channel sampled an anomalous area identified from previous exploration projects. Sampled 1m intervals along a 725 m long semi-continuous stripped area (J. Wakeford, Atikwa Minerals Ltd., personal communication, 2002). The 2001 sampling program collected 832 samples, the highest assay encountered was 155 ppb Pt+Pd (Atikwa Minerals Ltd., press release, October 2001).
2	Atikwa Minerals Ltd. (Norpax Deposit)	DD, Samp	PGE, Au, Cu, Ni	Completed a drill project based upon 2001 sampling program. A grab sample of Norpax dump material returned 7.0 g/t Pd and 16 g/t Pt (Atikwa Minerals Ltd., press release, October 2001).
3	Avalon Ventures Ltd. (Big Whopper Deposit)	Met, Samp	Li, Cs, Rb, Ta	Testwork was carried out on a 100 kg composite ore sample. Two grades of high-lithium feldspar product were produced; fine-grained (-200 mesh) ceramic and coarse-grained (-40, +200 mesh) glass grade material sample (Avalon Venture Ltd., press release, July 23, 2002). Two separate ceramic testwork studies has been conducted on part of the 100 kg sample (Avalon Venture Ltd., press release, August 21 2002). Avalon Ventures has announced they have entered into a sales and marketing agreement with Agalgament Canada. Avalon also continued engineering and feasibility studies. Based upon these studies a new dry process flowsheet shall evaluate the 5 tonne mini-bulk ore sample collected in November (Avalon Venture Ltd., press release, December 9, 2002).
4	Best, A. (Pistol Lake Property)	Pr, Samp	Au	Completed a sampling project on the property (A. Best, personal communication, January 2003).
5	Cameco Gold Inc. (Black Lake Property)	DD, Samp	Au	Completed a drill program targeting gold mineralization in the Moretti Deformation Zone. Gold mineraliztion was discovered during the 1999 drill program (Kenora assessment file 52J04SW 0041).

No.	Company/Individual (Occurrence or Property)	Exploration Activity	Commodity	Activity
6	Canmine Resources Ltd. (Werner Lake Cobalt Deposit)	DD, Samp	Co	A 15 hole drill program conducted to increase the resource base. New cobalt mineralization was intersected. More drilling is required to better define high-grade cobalt lenses (B. Ferreira, Canmine Resources Ltd., personal communication, February 2002).
7	Canterra Mining Limited (Sakoose Property)	AM, GL	Au	Conducted an airborne magnetic survey over the property and geological mapping (Kenora assessment file, 52F09SW EE-1).
8	Champion Bear Resources Ltd. (Separation Rapids Property)	DD, Samp	Li, Cs, Rb, Ta	Completed 4 DDH on the Marko's North pegmatite. Surface grab samples show tantalum values along the length of the pegmatite. Lithium and rubidium values appear to increase towards the east. Tantalum mineralization has been confirmed by both surface and drilling along a strike length over 300 metres (Champion Bear Resources Ltd., press release, September 5, 2002).
9	Chute, M. (Dash Lake Property)	GL, Samp	Au, Zn, Cu	Conducted a lithogeochemical survey (M. Chute, geologist, personal communication, February 2002).
10	Cousineau, L., Cousineau, R. and Desjardins, K. (Belacoma Property)	Pr, Samp	Cu	Located a new 5 metre Cu zone on the property (L. Cousineau, personal communication, January 2003).
11	Cousineau, L., Cousineau, R. and Desjardins, K. (Blueberry Property)	Str, Samp	Au, Pt, Pd, Cu	Exposed the outcrop by stripping in 3 previous known trenches on the property (L. Cousineau, personal communication, January 2003).
12	Cousineau, L., Cousineau, R. and Desjardins, K. (Halkirk Soapstone Property)	GL, Str, Pr, Samp	Soapstone	Additional stripping has been conducted on the property (L. Cousineau, personal communication, January 2003).
13	Emerald Fields Resource Corp. (Big Mack Property)	Met	Li, Cs, Rb, Ta	Continued work on a mill design to separate petalite from pegmatite ore material core (A. Mowat, personal communication, January 2003).
14	Emerald Fields Resource Corp. (Brownridge Twp. Property)	DD, Samp, Str	Li, Cs, Rb, Ta, Cu, Zn	Originally a base-metal project but located a new pegmatite. Stripped and sampled followed by a drill program completed in the fall (A. Mowat, personal communication, January 2003).
15	Emerald Fields Resource Corp. (Game Lake Property)	Samp	Zn, Cu	Sample drill core from Rio Algom Exploration Inc. 1986-87 drill project (A. Mowat, personal communication, January 2003).
16	Emerald Fields Resource Corp. (Scarp Lake Property)	GL, Pr, Str, Tr, Samp	Au, Cu, Ag	Exploration program targeted the sulphide zone that is hosted in felsic metavolcanic rocks and quartz feldspar porphyry intrusions (A. Mowat, personal communication, January 2003).
17	Emerald Fields Resource Corp. (Treelined Lake Graphite Prospect)	Met	Graphite	Conducted graphite metallurgical evaluation on a 10 kg ore sample (A. Mowat, personal communication, January 2003).

No.	Company/Individual (Occurrence or Property)	Exploration Activity	Commodity	Activity
18	Fairservice, R. Opawica Exploration Inc. (Straw Lake Gold Property)	GL, Samp	Au	Conducted a lithogeochemical survey over the property. A quartz vein hosted in granodiorite returned 2.75 oz/T Au (Kenora assessment file 52F/03NW X-1).
19	Glatz, A. (Giant Mine Property)	Pr, Samp	Au	Completed sampling project of the area near the shaft and adit (A. Glatz, personal communication, January 2003).
20	Glatz, A. & Kozowy, A. (Contact Bay Property)	Pr, Samp	PGE, Cu, Ni	Examined the silicifed and oxidized rocks , a possible extension of the Nabish Lake Intrusion (A. Glatz, personal communication, January 2003).
21	Glatz, A. & Riives, J. (Camreco Gold Prospect)	Pr, Samp, GM	Au	Property formerly known as the Windward Prospect. Completed ground magnetic and lithogeochemical surveys (J. Riives, personal communication, January 2003).
22	Glatz, A., Riives, J. and Fairservice, R. (Beartrack Lake South Property)	Pr, Samp	Au, Cu	Completed a lithogeochemical survey on the mafic intrusion and associated shear zones (A. Glatz, personal communication, January 2003).
23	Goldeye Explorations Limited (Boyer Lake Property)	GM, VLFEM	Au	Conducted a geophysical survey over property (Kenora assessment file 52F/07NE III-5,6).
24	Hexagon Gold Ontario Ltd. (Mine Centre Property)	Met, Samp	Au	Hexagon removed a 500 T bulk sample of quartz vein material from their property in 2000. Battle Mountain Gold conducted the metallurgical testing on a 70 kg sample in 2000. The Northern Empire Mill of Roxmark Mines Ltd. processed 276 T of the bulk sample. The average metallurgical grade was 0.111 oz/T Au and 19.506 oz of gold was recovered. 95% of gold recovery from gravity method (Kenora assessment file 52C/10NE HHH-1).
25	Houston Lake Mining Inc. (Ghost Lake Property)	Lc, VLFEM, GM	Ta, Cs, Li, Rb	Completed linecutting and ground geophysical survey (Kenora assessment file 52C/15SW FF-1).
26	Houston Lake Mining Inc. (McLennan Gold Property)	Str, Tr, Samp	Au	Hosted in altered mafic intrusive rocks, New Shear Zone, has been stripped of overburden for 100 m. This exposed rock was channel cut and sampled (Houston Lake Mining Inc., press release, December 13, 2002).
27	Johnson, S. & Prouty, K. (East Tache Property)	Pr, Samp	Pt, Pd, Cu	Completed a sampling project on the property (S. Johnson, personal communication, January 2003).
28	Johnson, S. & Prouty, K. (Pidgeon Property)	Pr, Samp	Au	Completed a sampling project on the property (S. Johnson, personal communication, January 2003).
29	Johnson, S. & Prouty, K. (Tab Lake Property)	Pr, Samp	Au, Cu, Zn	Completed a sampling project on the property (S. Johnson, personal communication, January 2003).

No.	Company/Individual (Occurrence or Property)	Exploration Activity	Commodity	Activity
30	King's Bay Gold Corporation (Swell Bay Property)	Lc, Samp, GEM	Au	Completed linecutting, a ground geophysical survey and channel sampling near the No.1 trench area (Kings Bay Gold Corporation, press release, December 13, 2002).
31	Metalore Resources Ltd. (East Cedartree Gold Property)	DD, Samp	Au	Completed 17 diamond drill holes targeting a silicified gold bearing zone. The company observed "fine to coarse visible gold in the core of more than half of the holes with multiple occurrences in several intersections" (Metalore Resources Ltd., press release, November 25, 2002).
32	Nelson Granite Ltd. (Forgotten Lake East Property)	Str, samp	Stone	Examination of 3 potential sites for yellow-coloured granites. Stone was produced from 1 of these sites property (G. Zebruck, personal communication, January 2003).
33	Nelson Granite Ltd. (Sand Lake Road Property)	DD, Str, Bulk, Samp	Stone	A small 99.12 m^3 (1067 ft^3) bulk sample was removed from a fine-grained reddish-brown coloured granite test site (G. Zebruck, personal communication, January 2003).
34	Nuinsco Resources Limited (Rainy River Property)	DD, Samp	PGE, Cu, Ni, Au	Conducted a drill program intended to follow-up on the 2001 ground MT survey. Several EM anomalies coincident with VMS alteration were tested by drill holes in the Marr Road, Dearlock Copper and Pinewood River areas (www.nuinsco.com).
35	Robinson, J. (Nelly Lake Property)	Pr, Samp	Li, Cs, Rb, Ta	Completed a sampling project on the property (J. Robinson, personal communication, January 2003).
36	Southern Rio Resources Ltd. (Minnitaki Lake Project)	DD, Samp	Au	Completed 8 drill holes on the Tak Patents. Gold mineralization in a felsic porphyritic host rock of the Porphyry Zone was tested with six holes. Visible gold in the core of hole #6 was noted in a number of places generally in late quartz and/or carbonate veins cutting strongly silicified and pyritized porphyry (Southern Rio Resources Ltd., press release, September 9, 2002). The Western Zone was tested by 2 drill holes. Quartz vein stockwork hosted in silicified, variably pyritic quartz-feldspar porphyry was intersected in the holes (Southern Rio Resources Ltd., press release, October 9, 2002).
37	Western Troy Capital Resources Inc. (Wagg Gold Property)	Bulk, Met	Au	Removed 125 tons of quartz rich rock in 2001. Processed 25 tons of material through ball mill and gravity circuit separation in a private milling facility. Recovered 8 oz of Au. Plan for 2003 is to remove 800 to 1000 tons of material (Western Troy Capital Inc., press release, February 8, 2002).

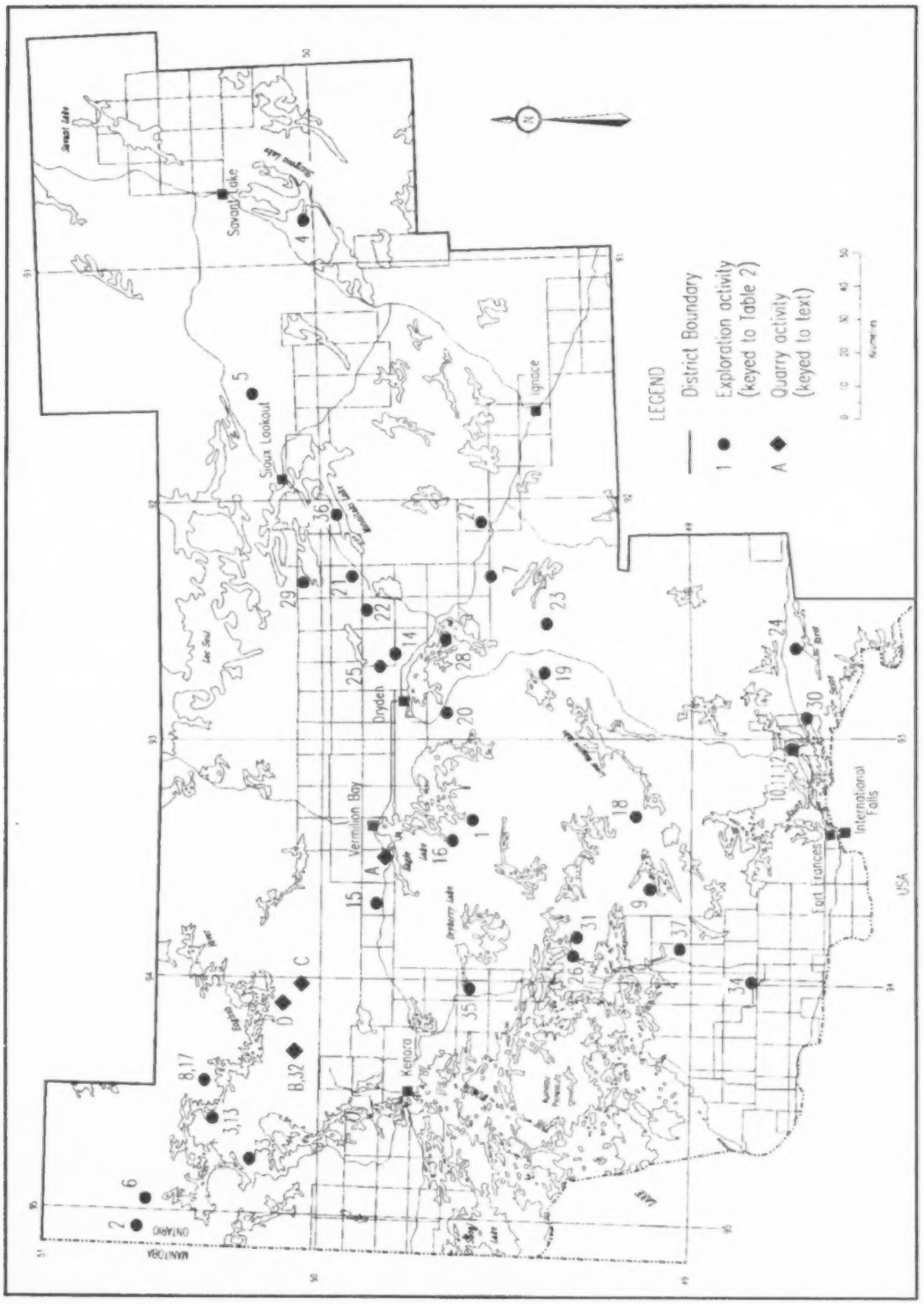


Figure 2. Exploration and quarry activity in the Kenora District in 2002.

Figure 3. Extent of staking in the Kenora District as of December 31, 2002.

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Kenora office was staffed by C. Ravnaas, District Geologist; A. Raoul, District Support Geologist (January 2002 to July 2002), Acting District Geologist (August 2002 to February 2003); P. Hinz, District Geologist (January 2002 to July 2002); S. Wilson, Acting District Support Geologist (August 2002 to February 2003); T. Engstrom, R. Peterson, J. Wilde and S. Wilson, summer assistants. The Sioux Lookout office will operate as a seasonal satellite office during the May to October summer field season. The field office in Sioux Lookout is maintained in conjunction with the Northern Development Office.

Kenora Resident Geologist staff attended the following events: the Prospectors and Developers Association of Canada Convention in Toronto; the Institute on Lake Superior Geology Annual Meeting in Kenora and the Manitoba Mining and Minerals Convention in Winnipeg, Manitoba. Staff delivered a "Mineral Exploration in the Kenora District" talk to the Canadian Institute of Mining meeting in Winnipeg.

Red Lake–Kenora Regional Resident Geologist staff and the Kenora Mining Association organized and co-Chaired the 48th Annual Meeting of the Institute on Lake Superior Geology in Kenora. Approximately 100 geologists attended the meeting and participated in 6 field trips and educational sessions.

Kenora District geology staff and representatives of the Ontario Geological Survey, Precambrian Geoscience Section, delivered Operation Treasure Hunt airborne geophysical survey education sessions to Eagle Lake First Nation. Education sessions on rock and mineral identification was also delivered to Eagle Lake elementary school students. This rock and mineral education session was also presented to École de St Francis elementary school in Fort Frances. A geological tour of the Kenora area was presented to the Kenora Metis Council. Staff also presented an education session on mineral exploration and mine rehabilitation to the students participating in the Dryden High School Conservation course.

Staff participated in a "Geology and mineral deposits in the Wabigoon area" tour delivered by Ontario Geological Survey geologist Gary Beakhouse. Staff of the Red Lake and Kenora District geology offices presented a field examination of a typical volcanogenic massive sulphide environment to 41 clients.

Office staff, with the assistance of summer assistants completed a review of historical mineral deposits and property visit reports versus mineral deposits inventory records (MDI). New MDI records developed during this process are being entered into the database.

During 2002, the staff of the Kenora District office conducted 39 property visits, inspections and examinations (*see* Table 3, Figure 4). The District office handled 362 personal consultations and 446 telephone inquires.

Property and Field Examinations

Properties visited by staff of the Kenora District office in 2002 are listed and described below. Primary authorship for the property and field examination descriptions are in parentheses following the heading title.

Table 3. Property and field examination conducted by the Kenora District Geologists in 2002.

Number (keyed to Figure 4)	Client – Occurrence
1	Atikwa Minerals Ltd. – Mulcahy Gabbro occurrence
2	Avalon Ventures Ltd. – Big Whopper deposit
3	Champion Bear Resources Ltd. – Marko's Pegmatite occurrence
4	Chute, M. -Dash Lake occurrence
5	Cousineau Brothers - Belacoma occurrence
6	Cousineau Brothers - Blueberry occurrence
7	Cousineau Brothers – Soapstone
8	Emerald Fields Resource Corp. – Big Mack prospect
9	Emerald Fields Resource Corp. – Brownridge occurrence
10	Emerald Fields Resource Corp. – St. Anthony Mine
11	Glatz, A. - Cole Lake North occurrence
12	Glatz, A. - Cole Lake South occurrence
13	Glatz, A. – Giant occurrence
14	Glatz, A. – Rattlesnake Lake occurrence
15	Glatz, A., Kozowy, A. – Contact Bay occurrence
16	Glatz, A., Riives, J. – K 171 Shaft occurrence
17	Glatz, A., Riives, J. – McCombe occurrence
18	Glatz, A., Riives, J. – Peninsula occurrence
19	Glatz, A., Riives, J. and Fairservice, R. – Beartrack Lake South occurrence
20	Houston Lake Mining Inc. – McLellan occurrence
21	Huston, C. – Beidelman Bay occurrence
22	Johnson, S., Prouty, K. – East Tache occurrence
23	Johnson, S., Prouty, K. – Pidgeon Au occurrence
24	Johnson, S., Prouty, K. – Tab Lake occurrence
25	Metalore Resources Ltd. – East Cedartree occurrence
26	Plomp, F. – Plomp Farm prospect
27	Robinson, J. – Nelly Lake Pegmatite occurrence
28	Southern Rio Resources Ltd. – Burnhut Island occurrence
29	Southern Rio Resources Ltd. – Galena occurrence
30	Southern Rio Resources Ltd. – Malachite occurrence
31	Southern Rio Resources Ltd. – Peninsula zone 3 occurrence
32	Southern Rio Resources Ltd. – Tak occurrence
33	Staff Examination – Bending Lake VMS fieldtrip
34	Staff Examination – Marchington Road prospect
35	Staff Examination – Minaki Pyrite occurrence
36	Staff Examination – New Kelore occurrence
37	Staff Examination – Octopus Lake occurrence
38	Staff Examination – Pidgeon Au-Zn occurrence
39	Tantalum Mining Corporation – Separation Rapids Pluton

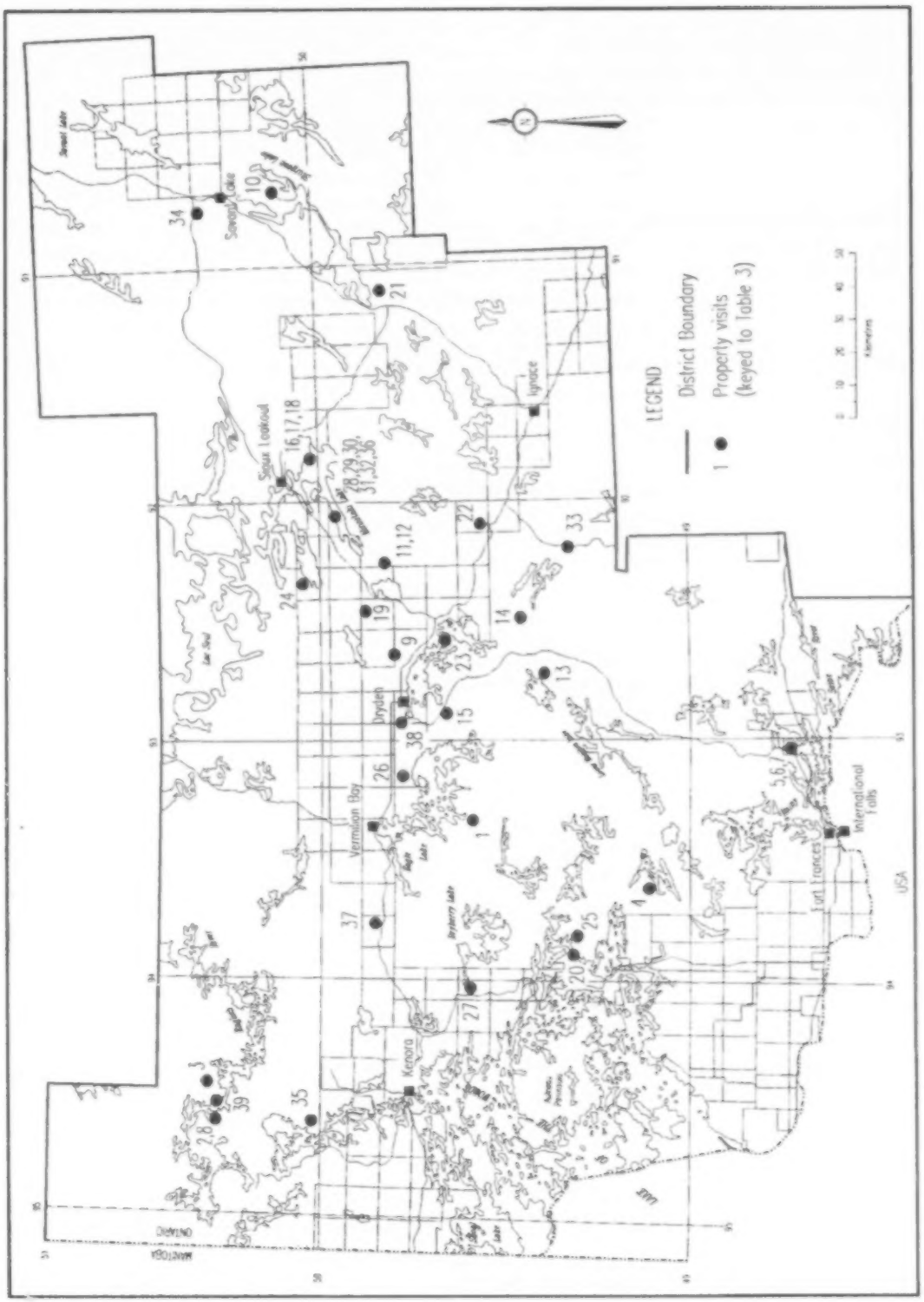


Figure 4. Property and field examinations conducted in the Kenora District in 2002.

SOUTH BEARTRACK LAKE OCCURRENCE (C. RAVNAAS)

The South Beartrack Lake property is located in Laval Township (NTS 52 F/16SW), approximately 25 km northeast of the town of Dryden. The property, located south of Beartrack Lake, is held by Messrs. A. Glatz, J. Riives and R. Fairservice. The property is accessible via the Ghost Lake Road. Road construction and logging activity provides additional access and has created new outcrop exposures on the property.

The South Beartrack Lake occurrence consists of anomalous gold and zinc mineralization in sulphidized and magnetite-bearing mafic intrusive rocks. The fine- to coarse-grained, altered leucogabbro is intruded along the boundary between mafic and intermediate metavolcanic rocks (Berger 1990; Chorlton 1991) and is interpreted to be subvolcanic. Quartz ± tourmaline veins intrude the metavolcanic and intrusive rocks in the area.

The area is underlain by intercalated mafic to intermediate metavolcanic rocks of the Neepawa group, part of the Minnitaki Lake greenstone belt, Wabigoon Subprovince (Blackburn et al. 1991). Berger (1990) and Chorlton (1991) provide descriptions of the stratigraphy and lithologic character of the Neepawa group.

Three mineralized areas, the Trench, Pit and Copper-Magnetite areas, were examined during a 2002 property visit (Figure 5). Descriptions of samples and selected assay results are in Tables 4 and 5, respectively.

Trench Area

Trenching exposed altered, vari-textured leucogabbro, weathered zones, sulphidized zones and quartz ± tourmaline veins. The coarse-grained leucogabbro is associated with increased amounts of calcite and chlorite, but is not visibly sulphidized or silicified. Grab samples, BT-10, -11, -13, -14, returned low base and precious metal values.

Selected grab samples collected by Fairservice (1989) and Berger (1990) from the Trench Area returned 0.25, 0.92 and 2.34 ounces per ton gold. Grab sample BT-09 (Figure 5) returned 0.35 ounces per ton gold in a silicified leucogabbro containing approximately 15% sulphides. Slab cuts of this rock revealed three stages of silica introduction and pyritization. The 1st stage is quartz flooding with fine-grained, disseminated pyrite. The 2nd stage is quartz veins intruded along fractures and are associated with coarse-grained pyrite. A third episode of quartz veinlets, barren of sulphides, cuts the first two stages. It is not known which stage of silicification/sulphidation introduced gold into the system.

A siliceous-sulphide bearing diorite is located in the central part of the trench. Chip sample BT-07 returned anomalous zinc and elevated gold values.

A 6 m long, north-trending elongated xenolith of metavolcanic rock is located between this zone and sample location BT-09. This rock is fine grained, chloritized and contains 3% disseminated medium-grained pyrite. A grab sample, BT-12, of this xenolith returned low gold values.

The mafic intrusive rocks adjacent to the trench are barren of sulphide mineralization. Small, 20 to 70 cm wide weathered zones occur elongated along 070° and sub-perpendicular (320°) to the fabric evident in the mafic intrusive rocks. These zones are interpreted by Chorlton (1991) to be the product of lateral extension and cross fracturing during compressional events. These siliceous, sulphide-bearing zones returned low gold values.

Numerous quartz ± tourmaline veins are located near the excavated trench. The veins intrude the mafic intrusive rocks and weathered pods at approximately 070° and 300°. Selected grab samples of returned low gold and base metal values.

Pit Area

The pit area is located approximately 210 m northeast of the trench zone. The boundary between a northern granodiorite unit and the eastern metavolcanic rocks are exposed at this location. A 10 cm wide weathered zone is located within the foliated granodiorite. Narrow width quartz veins intrude sub-perpendicular to foliation. Samples of the weathered zone and quartz veins, BT-15 and -16, respectively, returned low gold and base metal values.

Copper-Magnetite Area

The Copper-Magnetite Area is located approximately 70 m north of the Trench Area and 165 m southwest of the Pit Area. The Copper-Magnetite Area is dominated by a 2 m wide shear zone that can be traced 20 m along a 030° strike, parallel to the mafic intrusive contact. The northern portion of the shear zone exposed in the trench is known as the Copper Zone. The Copper Zone occurs in silicified and saussuratized diorite, with 30 to 70% quartz flooding, 3% magnetite, 5% chlorite schist and 5% sulphide. Narrow (1 cm wide) layers of magnetite and elongated (2 to 3 cm long) rafts of chlorite schist parallel the trend of the shear zone. These layers and rafts are confined to the shear zone. A representative grab sample, BT-18, of the copper zone, returned anomalous copper, zinc and cobalt values.

The part of the Copper-Magnetite Area known as the Magnetite Zone is located approximately 15 m south of the Copper Zone. The width of the sheared rock at the magnetite zone is similar to that at the Copper Zone. Several 1 to 3 cm thick parallel layers of boudinaged magnetite occur within the shear. Chalcopyrite fills strain fractures parallel to the trend of the magnetite layering and shear zone. A representative grab sample, BT-20, of chalcopyrite-mineralized shear returned anomalous copper, zinc and cobalt values.

Narrow width quartz veins intrude sub-perpendicular to the trend of the shear rock at the Magnetite Zone. These quartz veins intrude both the shear zone and host mafic intrusive rocks. Grab samples of the quartz veins, BT-19, returned low gold, copper and zinc values.

Only sheared, siliceous, sulphidized and magnetite-bearing zones returned elevated base and precious metal values. These mineralized zones trend parallel to the contact with adjacent mafic volcanic rocks. The quartz and quartz-tourmaline veins and weathered-siliceous zones are barren of mineralization. Examination of the mafic intrusive and metavolcanic rocks on the property, that display similar lithological and structural features to the mineralized zones should be examined. Examination, between and along strike, of the Trench and Copper-Magnetite zones could extend the mineralized areas.

Table 4. Description of samples collected from the South Beartrack Lake property.

Sample Area	Rock Type	Alteration Minerals	Sample Description
BT – 02 trench	quartz-tourmaline vein	Albite	Vein consists of 45% quartz, 55% tourmaline, nil sulphides. The 3 cm wide vein trends 070/90°.
BT – 03 trench	altered gabbro	Calcite, chlorite, epidote	Gabbro adjacent to quartz-tourmaline vein (BT – 02). Alteration minerals comprise 30% of rock.
BT – 04 trench	quartz vein	Sulphides	White-to gray coloured quartz, 5% medium-grained pyrite The 40 cm wide vein trends 310/60N.
BT – 05 trench	weathered gabbro	Quartz, sulphides	A 20 cm wide siliceous weathered zone, 5% pyrite, zone elongated at 070°.
BT – 06 trench	quartz-tourmaline vein	Nil	50% quartz and 50% tourmaline, sample contains wall-rock gabbro. The 5 cm wide vein trends 280/90°.
BT – 07 trench	weathered diorite	Quartz, sulphides	Weathered zone in trench, 10% fine-grained pyrite. Distinctive medium-grained elongated amphibole grains.
BT – 08 trench	quartz-tourmaline vein	Calcite	White quartz bordered by black tourmaline. The 5 cm wide vein trends 270/60N.
BT – 09 trench	mineralized gabbro	Sulphides, quartz	3 stages of quartz and associated pyrite. Disseminated pyrite associated with 1st stage quartz flooding. Coarse pyrite associated with 2nd stage quartz injections along fracture. 3rd stage barren quartz veinlets that cut previous sets.
BT – 10 trench	strained gabbro	Calcite, chlorite	Distinct strain to rock. Trace sulphides. 10% disseminated calcite.
BT – 11 trench	strained gabbro	Calcite	Distinct strain to rock. Trace sulphides. 5% disseminated calcite. Medium-grained amphibole grains elongated parallel to fabric.

Sample Area	Rock Type	Alteration Minerals	Sample Description
BT – 12 trench	metavolcanic rock	Chlorite	A north trending-elongated metavolcanic rock xenolith, 3% medium-grained pyrite. Medium-grained amphibole grains elongated parallel to fabric.
BT – 13 trench	strained gabbro	Chlorite	Distinct strain to rock. 5% pyrite. Medium-grained amphibole grains elongated parallel to fabric.
BT – 14 trench	gabbro	Calcite, chlorite	Distinctive white-colored feldspar crystals orientated in random direction, 5% calcite, trace pyrite.
BT – 15 pit	weathered granodiorite	Sulphides, chlorite	Sample of 10 cm wide zone of weathered granodiorite, 3% pyrite. Zone elongated along 010/90°.
BT – 16 pit	quartz vein	Nil	Sample of 3 cm wide quartz vein that is located at contact of mafic metavolcanic and granodiorite.
BT – 17 pit	quartz vein	Epidote chlorite, sericite	Sample of a 10 cm wide quartz vein hosted by mafic intrusive rock. 5% pyrite.
BT – 18 magnetite	altered diorite	Quartz, epidote, chlorite, magnetite	30–70% quartz flooding, 1% pyrite, 3% chalcopyrite, 2% narrow-layered magnetite bands hosted in mafic intrusive rock.
BT – 19 magnetite	quartz vein	Chlorite	Sample of narrow quartz veins that cuts magnetite-bearing mafic intrusive rock. These 3 cm wide veins trend 270/90°.
BT – 20 magnetite	altered diorite	Quartz, epidote, chlorite, magnetite	5% narrow quartz veins, 5% pyrite, 2% narrow-layered magnetite bands hosted by mafic intrusive rock.

Table 5. Selected assay results from the South Beartrack Lake property.

Sample	Rock Type	Au ounces per ton	Ag ounces per ton	Cu ppm	Co ppm	Zn ppm	Ba ppm
BT - 02	quartz-tourmaline vein	N.D.	0.8	43	29	89	159
BT - 03	gabbro	N.D.	N.D.	24	23	92	443
BT - 04	quartz vein	N.D.	N.D.	282	N.D.	5	N.D.
BT - 05	weathered metavolcanic xenolith	N.D.	N.D.	45	13	211	2638
BT - 06	quartz-tourmaline vein	N.D.	N.D.	138	14	71	N.D.
BT - 07	weathered gabbro	0.02	N.D.	166	25	**3010**	991
BT - 08	quartz-tourmaline vein	N.D.	N.D.	72	32	92	71
BT - 09	gabbro	**0.35**	N.D.	120	12	**971**	2635
BT - 10	gabbro	N.D.	N.D.	95	31	114	281
BT - 11	gabbro	N.D.	N.D.	78	37	156	259
BT - 12	metavolcanic xenolith	N.D.	0.2	7	13	245	106
BT - 13	gabbro	N.D.	N.D.	24	39	826	52
BT - 14	gabbro	N.D.	N.D.	27	41	270	20
BT - 15	weathered granodiorite	N.D.	N.D.	83	29	436	700
BT - 16	quartz vein	N.D.	N.D.	15	19	51	72
BT - 17	quartz vein	N.D.	N.D.	72	19	140	144
BT - 18	diorite	0.03	N.D.	**>1000**	203	**>4000**	54
BT - 19	quartz vein	N.D.	N.D.	33	4	31	70
BT - 20	diorite	N.D.	N.D.	**>1000**	278	439	591

N.D. not detected, >1000 value exceeds detection limit
Bold font indicates evaluated or anomalous values

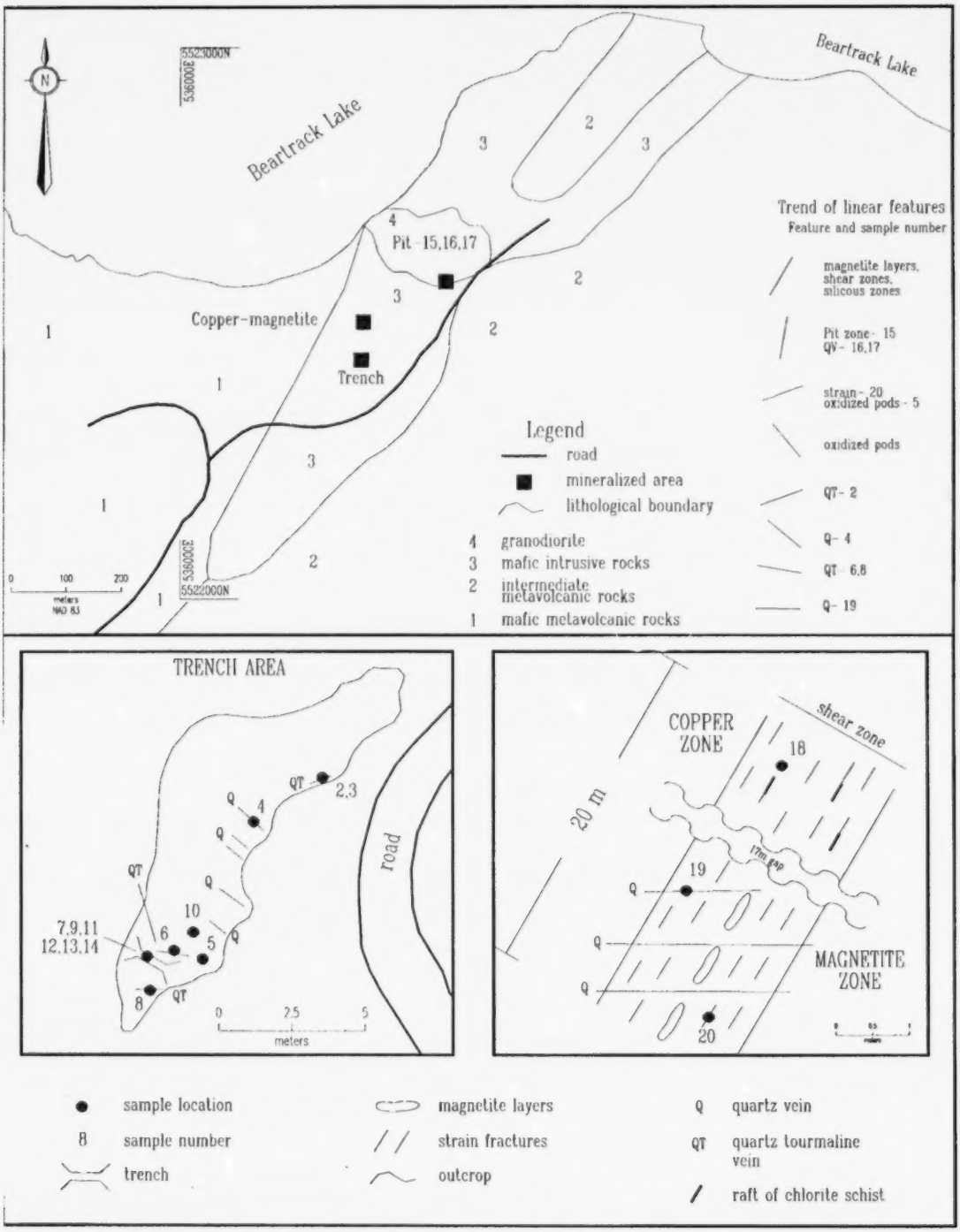


Figure 5. Geology and sample location of the South Beartrack Lake property (*modified after* Berger 1990).

McLELLAN PROPERTY, CAMERON LAKE AREA (A. RAOUL)

The property is located 13 km southeast of Sioux Narrows, Ontario (52F/05SW). Access is gained by travelling 8 km east on the Cameron Lake Road from Highway 71. The property is wholly owned by Houston Lake Mining Inc. and consists of Patented Mining Claims K99991 to K10000, K10024 to K10030, K10058 to K10059, K314923 and K314932 (GPS Location: 5463995N, 0435542E NAD83) (Figure 6).

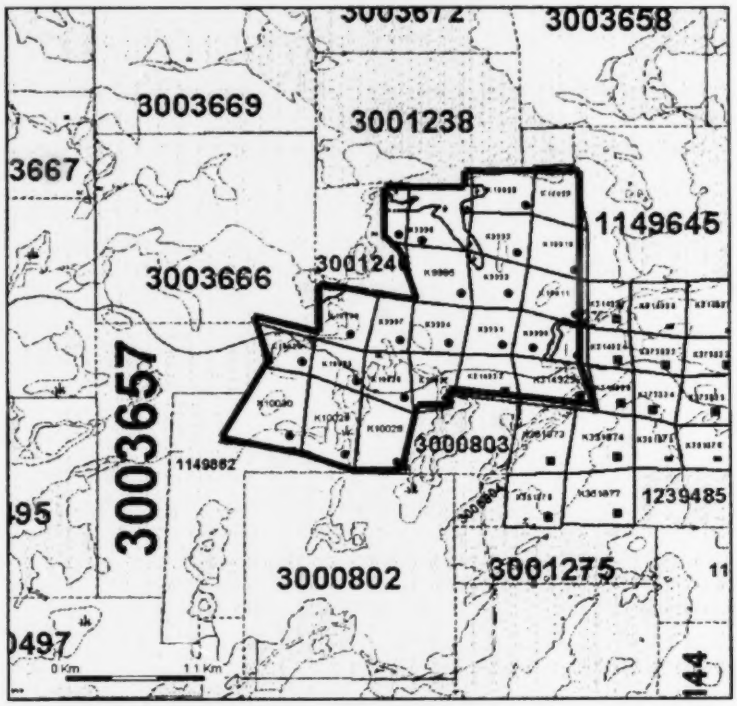


Figure 6. Location of the McLellan property (Claim Map G-1613, September 01, 2002).

The geology of the Dogpaw Lake area was described by Davies and Morin (1976) as

> The rocks in the map-area are steeply-dipping, Early Precambrian, mafic volcanics overlain by a complex of intermediate to felsic metavolcanics, intruded by differentiated mafic to ultramafic sills. Lenticular to irregularly shaped gabbro intrusions occur in the mafic metavolcanic.

Trenching and stripping of the New Shear Zone ("NSZ") by Houston Lake Mining in 2002 was followed by a program of channel sampling. Reported assay results include 9.11 g/t Au over 5.80 m, 5.39 g/t Au over 3.95 m and 5.71 g/t Au over 3.00 m (Houston Lake Mining Inc., press release, September 12, 2002). The current property examination was conducted on the exposed 7 to 8 m wide NSZ. The NSZ is dominated by highly sheared and altered gabbro which was traced over an 80 m strike-length, trending 020°/80°E.

Both the moderately and highly altered gabbro phases contain 10 to 30% Fe-carbonate (ankerite and minor siderite) and 5 to 20% calcite, and show no relic "gabbroic" texture. The highly altered gabbro also has weak silicification evidenced by minor quartz flooding (<10%), trace to 2% epidote alteration and contains fuchsite (7 to 10%).

The stratigraphy of the New Shear Zone can be divided into the following units, from east to west (Figure 7):

A 2 to 8 m wide unit of weakly altered gabbro (unit 1A), the original host rock. The gabbro is medium grained, weakly to moderately saussuratized, with 10 to 25% chlorite-epidote-calcite alteration. A weak NE to NNE foliation has overprinted this unit (sample AR02016). Major element geochemistry shows strong Mg addition indicative of chloritization. This alteration may be related to a regional metamorphic event rather than VMS-style alteration due to its low sulphur content (Table 6).

1. Unit 2 is a 30 to 40 cm wide fine-grained andesite dike (sample AR02017), parallel to the shear structure.
2. The sheared and altered gabbro of the NSZ was divided into the following subunits:
   - A 2.0 to 2.5 m wide subzone (unit 1B) of moderately carbonatized mafic schist (no sample taken). The alteration consists of moderate amounts (20 to 30%) of Fe- and Ca-carbonate with no fuchsite present.
   - A 3.5 m wide subzone (unit 1C) of highly carbonatized mafic schist. The alteration consists of high amounts (35 to 50%) of Fe- and Ca-carbonate, minor silica flooding, 5 to 10% fuchsite and 1 to 2% epidote. Whole rock geochemistry indicates a highly altered gabbro with high volatile content, probably due to the presence of iron and calcium carbonates. A 1.5 m chip sample (sample AR02019) returned 5.33 g/t Au and a second continuous 2.0 m chip sample (sample AR02018) returned 2.58 g/t Au (Table 7).
   - A 0.5 to 1.5 m subzone (unit 1B) of moderately altered, carbonated mafic schist (no sample taken). Alteration consists of moderate amounts (20 to 30%) of Fe and Ca carbonate with no fuchsite present. This unit is the same subzone as above and appears to continue westward under overburden.

Table 6. Major element geochemistry, CO_2 and S analyses of the New Shear Zone, McLellan property.

Sample	SiO_2 %	Al_2O_3 %	Fe_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	MnO %	P_2O_5 %	TiO_2 %	LOI %	CO_2 %	S %
AR02016	45.22	10.17	11.14	1.63	21.41	0.12	0.13	0.10	N.D.	0.25	9.61	2.76	0.03
AR02017	52.95	16.28	9.43	1.78	7.41	5.74	0.12	0.11	0.36	1.07	6.01	N/A	N/A
AR02018	44.80	6.70	9.74	6.17	11.31	0.51	0.35	0.17	0.06	0.28	19.62	17.00	0.12
AR02019	48.25	7.07	13.29	2.40	10.60	0.36	0.29	0.18	0.02	0.27	15.88	N/A	N/A

Table 7. Selected assay results of the New Shear Zone, McLellan property.

	Rock Descriptions	Au ppb	Ag ppb	Pd ppb	Pt ppb	Zn ppm	Cu ppm	Pb ppm
AR02016	Weakly altered gabbro (chloritic)	7	N.D.	N.D.	N.D.	61	16	2
AR02017	Andesite dike	N.D.	N.D.	N.D.	N.D.	69	12	6
AR02018	Altered gabbro (fuch-silc-carb)	2576	N.D.	N.D.	N.D.	59	61	21
AR02019	Altered gabbro (fuch-silc-carb)	5334	N.D.	N.D.	N.D.	79	57	39

A tentative sequence of events would include:

1. Intrusion of the parental gabbro;
2. Alteration (chloritization) of the gabbro by regional metamorphic event;
3. Primary shear formation with the introduction of Ca- and Fe-carbonates and gold along a major structure; Secondary, parallel shear event within the same primary structure. This second event introduced silica and epidote with "high grade" gold values. Present sampling averaged 3.76 g/t Au over 3.5 m in chip samples.

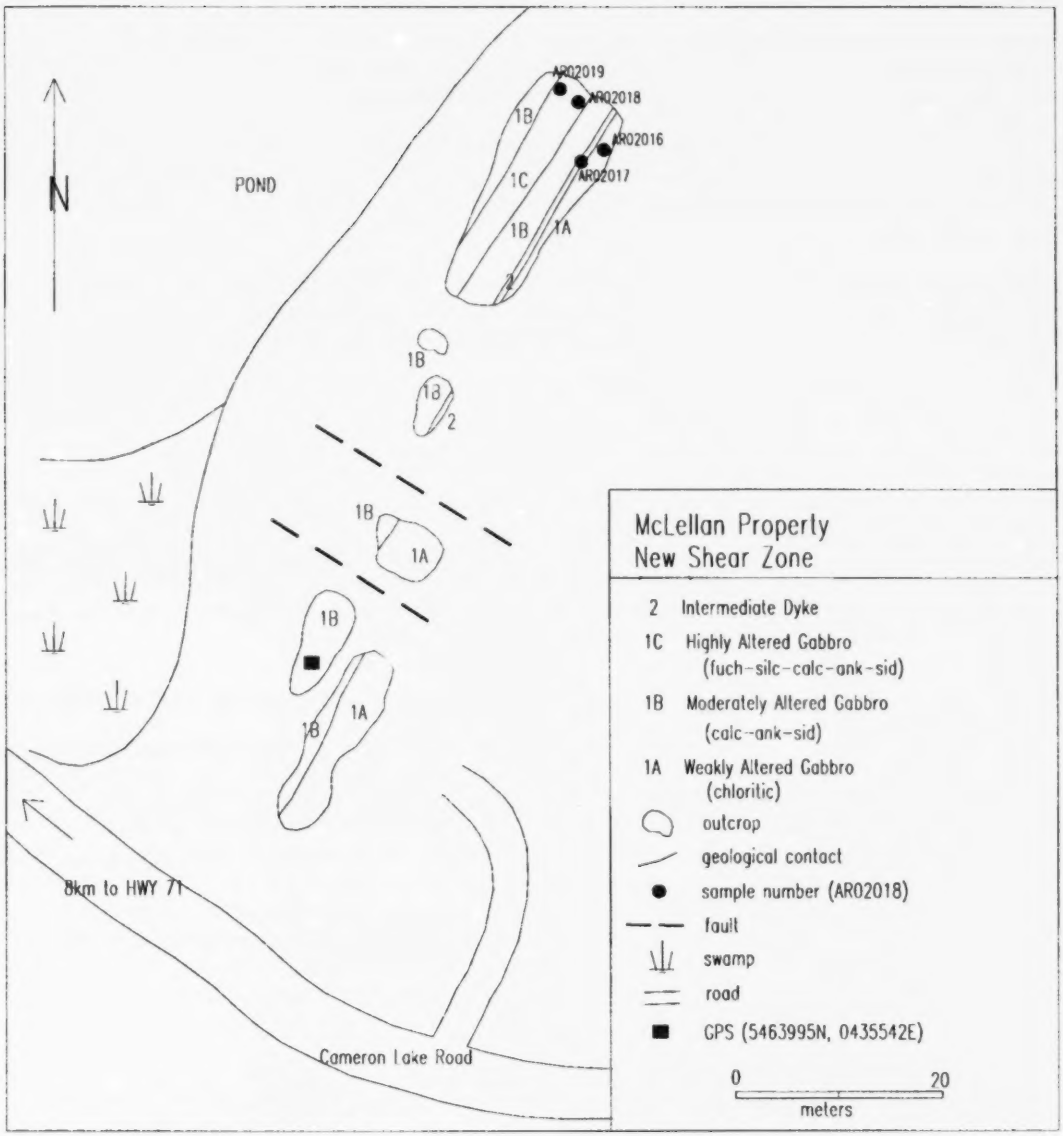


Figure 7. Sampling of the New Shear Zone, McLellan property. Abbreviations: fuch – fuchsite, silc – silica, calc –calcite, ank – ankerite, sid – siderite.

NELLY LAKE PROPERTY, WORK TOWNSHIP (A. RAOUL)

The Nelly Lake Property is located in Work Township (NTS 52F/9SE), approximately 32 km southeast of the City of Kenora. The property lies 1 km east of Highway 71, on the Nelly Lake Road at GPS Location: 5495278N, 423207E NAD 27.

The property consists of one six-unit unpatented mining claim, K1221271 on claim map G1360, held by John Robinson of Kenora. It was acquired to test the rare-metal potential of the Graphic Lake granite and pegmatite outcrops northwest of Nelly Lake, discovered by J. Robinson.

Rare-metal mineralization was first documented by Trowell, Logothetis and Caldwell (1982) as beryl-bearing, muscovite pegmatites near Graphic Lake (Breaks, Selway and Tindle 2001). The area was mapped by Trowell (Trowell 1986). Breaks, Selway and Tindle (2001) found ferrocolumbite in the Graphic Lake pegmatites.

The area is underlain by rocks of the Lake of the Woods greenstone belt. In the Graphic Lake area, the belt consists of mafic metavolcanic rocks of the Dogtooth group. To the south of Gibi and Andy lakes, the mafic rocks are overlain by both the mafic volcanic and felsic members of the Gibi Lake volcanic group. All of the volcanic rocks are intruded by pegmatitic granites of the Graphic Lake granite (also known as the Nelly Lake granite). This volcanic sequence is overlain by metasediments of the Warclub group. This entire package was later intruded by the Dryberry batholith, exposed to the north and east (Figure 8).

Regional reconnaissance mapping by Breaks, Selway and Tindle (2001) examined the Graphic–Tower Lakes area. The Graphic Lake pegmatite dikes, located west of the property, are composed of massive, white, garnet-muscovite potassic pegmatite with moderate amounts of garnet-muscovite granite and subordinate sodic aplite. Beryl and ferrocolumbite were documented in the largest dike. Sampling of 4 potassium feldspar crystals indicated levels of Rb (mean 1707 ppm; range 1695 to 2002 ppm), and Cs (mean 38 ppm; range 35 to 42 ppm) that are typical for beryl-type, rare-metal pegmatites.

Rocks exposed on the Nelly Lake property consist of a series of pegmatite dikes intruded at the contact of the Graphic Lake granite, located to the south, and the east- striking Warclub group metasediments in the north. The Warclub group consists of metagreywacke and interlayered magnetite-chert iron formation. These interlayered units of iron formation are represented in Airborne Magnetic Map 1178 (GSC–OGS 1961) as a magnetic high response. This magnetic high is approximately 2 km wide and continues eastward for 5 km.

The Graphic Lake granite is a phase of the Dryberry batholith and is interpreted to have intruded along a major structure during batholith emplacement. Pegmatites in the Kenora District commonly intrude along major structural features; if the Graphic Lake granite is the source of the Nelly Lake pegmatite field, then the structure controlling granite emplacement may have played a key role in emplacement of the Nelly Lake field as well.

A "mottled" appearance along grain boundaries is due to a tectonic overprint parallel to the regional foliation (040° to 050°) so these pegmatite outcrops and dikes must have formed prior to regional deformation.

The property was sampled by Storey (1990). He reported

> A large number of white to pale pink pegmatites intrude the metasediments and metavolcanics in this area. They are roughly parallel to the foliation of the host rocks (040° to 050°). Rudimentary zoning is evident in one pegmatite observed near the south end of Graphic Lake, where small quartz segregations were observed. The remainder of the pegmatites are homogenous but some of the large ones have minor replacement or fracture filling zones. The major minerals present are pale green muscovite, biotite, quartz, white to pale pink microcline and microcline graphic granite. Trowell (1979) tentatively identified beryl from some of these pegmatites. Xenoliths of the host rock are common.

Twenty grab and chip samples were collected between Graphic Lake and Nelly Lake straddling the present property (Storey 1990). Samples with elevated lithium values (158, 170 and 860 ppm) were located on the east side of Graphic Lake, west of the Nelly Lake property. However, no elevated Be or Nb values were located. It should be noted that the analyses did not include Cs or Rb.

A pegmatite exposure in the central portion of the property (Outcrop 1, Figure 8) was sampled in 2001 (samples AR01020 and AR01021). Both samples had anomalous Rb values (486 and 494 ppm) and anomalous Cs (20 and 23 ppm).

The pegmatite outcrops on the property were mapped and sampled as grab or chip samples during the current examination. Ten pegmatite samples and one parental granite sample, from the Graphic Lake granite (AR02032), were collected. Figure 8 illustrates the sample locations, and Tables 9 and 10 represent the major element geochemistry and selected rare-metal geochemistry.

Since a limited number of assays were done, a true qualitative analysis comparison can not be done for the property. Table 8 (Galeschuk 1999) represents the statistically derived, lithogeochemical threshold values from a Tantalum Mining Corporation of Canada study of its Separation Rapids rare-metal pegmatite occurrences. This survey is used for comparison with the Nelly Lake property.

Table 8. Statistically derived lithogeochemical threshold values from the Separation Rapids Project (Galeschuk 1999).

Rock Type	Background			Possible Anomalous			Anomalous			Highly Anomalous		
	Li	Cs	Rb	Li	Cs	Rb	Li	Cs	Rb	Li	Cs	Rb
Mafic volcanic	<35.5	<1.7	<72.2	35.6-55.9	1.7-5.6	72.2-100.9	55.9-227.7	5.6-39.6	100.9-484.6	>227.7	>39.6	>484.6
Felsic volcanic	<16.6	<3.0	<75.8	16.6-38.9	3.0-5.5	75.8-159.7	38.9-109.8	5.5-21.9	159.7-406.5	>109.8	>21.9	>406.5
Mafic intrusive	<46.0	<4.2	<29.6	46.0-54.0	4.2-6.4	29.6-38.4	54.0-334.6	6.4-15.1	38.4-134.3	>334.6	>15.1	>134.3
Felsic intrusive	<27.2	<6.6	<302.4	27.2-42.3	6.6-15.2	302.4-485.1	42.3-86.1	15.2-29.4	485.1-1769.4	>86.1	>29.4	>1769.4
Peg. granite	<49.6	<12.4	<230.4	49.6-116.4	12.4-16.2	230.4-321.3	116.4-380.6	16.2-125.7	321.3-2292.7	>380.6	>125.7	>3392.7

Outcrop descriptions and sample summaries follow:

Outcrop 1: White Pegmatite

White to pink, coarse-grained, massive pegmatite comprising coarse potassium feldspar (possibly microcline)-quartz-plagioclase with small, secondary fracture fillings of chlorite-muscovite books and trace to 3% biotite-garnet.

Sample AR02025: White pegmatite - anomalous Rb (>400 ppm) and anomalous Cs (23 ppm)
Sample AR02026: White pegmatite - anomalous Rb (>400 ppm) and anomalous Cs (45 ppm)
Sample AR02027: White pegmatite - anomalous Rb (>400 ppm), Cs (45 ppm), Nb (199 ppm) and highly anomalous Ta (151 ppm)

Further work by J. Robinson has traced this pegmatite dike over a 300 m strike-length (J. Robinson, personal communication, September 2002).

Table 9. Major element geochemistry of samples collected from the Nelly Lake property.

Sample	SiO_2 %	Al_2O_3 %	Fe_2O_3 %	CaO %	MgO %	K_2O %	Na_2O %	MnO %	P_2O_5 %	TiO_2 %	LOI %
AR02025	72.83	14.74	0.49	0.15	0.11	7.28	3.15	0.02	0.03	0.04	0.73
AR02026	75.49	13.83	0.42	0.45	0.05	3.43	5.17	0.01	0.02	0.06	0.70
AR02027	81.03	11.11	0.60	0.17	0.07	2.00	3.77	0.20	0.03	0.04	0.82
AR02028	75.62	13.90	0.43	0.58	0.06	1.98	6.08	0.07	0.04	0.03	0.64
AR02029	75.96	13.62	0.33	0.71	0.01	1.80	6.41	0.02	0.02	0.04	0.47
AR02030	73.36	14.50	0.14	0.10	0.01	8.77	3.09	0.01	0.03	0.01	0.30
AR02031	78.60	12.07	0.35	0.47	0.02	2.75	5.11	0.02	0.01	0.04	0.44
AR02032	69.06	16.22	2.22	3.20	0.65	0.83	6.04	0.03	0.12	0.29	0.85
AR02033	75.59	13.80	0.58	0.28	0.02	4.04	4.72	0.18	0.03	0.02	0.59
AR02034	74.72	14.46	0.43	0.33	0.04	4.21	4.65	0.04	0.02	0.04	0.78
AR02035	75.28	14.36	0.71	0.50	0.04	1.59	6.25	0.03	0.03	0.03	0.77

Table 10. Selected rare-metal geochemistry of samples collected from the Nelly Lake property.

Sample	GPS Location		Be ppm	Cs ppm	Li ppm	Nb ppm	Rb ppm	Ta ppm
AR02025	5495278N	423207E	N.D.	**23**	68	41	**>400**	4
AR02026	5495277N	423205E	N.D.	**45**	73	69	**>400**	6
AR02027	5495277N	423196E	3	**36**	60	**199**	**380**	**151**
AR02028	5495051N	423162E	5	**19**	45	**366**	233	6
AR02029	5495277N	423205E	3	11	30	69	139	7
AR02030	5495000N	423182E	N.D.	**35**	13	33	**>400**	4
AR02031	5494976N	423201E	2	11	13	67	245	6
AR02032	5494981N	423194E	N.D.	5	**94**	4	33	N.D.
AR02033	5495000N	423182E	2	**17**	50	30	**>400**	3
AR02034	5495525N	423557E	2	**16**	41	43	**>400**	3
AR02035	5495527N	423557E	4	14	53	47	222	6

Bold indicates elevated values

Outcrop 2: Pink Pegmatite

Pink, coarse-grained, potassium feldspar-rich (>50% microcline) pegmatite with small pods of plagioclase and mica books.

Sample AR02028: Pink pegmatite - anomalous Nb (366 ppm) possibly due the presence of unidentified black opaque minerals
Sample AR02029: Graphic granite - no anomalous rare-metal values

Outcrop 3: Pink Pegmatite

Pink, coarse-grained pegmatite composed of >80% potassium feldspar (microcline) with minor quartz and plagioclase (<10% each). This pegmatite shows a more pronounced graphic granite texture at the south end. Graphic Lake granite comprises the western portion of the outcrop.

Sample AR02030: Potassium feldspar pegmatite - anomalous Rb (>400 ppm) and anomalous Cs (35 ppm)
Sample AR02031: Pegmatite to graphic granite - no anomalous rare-metal values
Sample AR02032: Fine-grained granite - this sample returned the highest lithium value (94 ppm) indicating that the parental magma may have been enriched in Li.

Outcrop 4: White Pegmatite

White, coarse-grained pegmatite of potassium feldspar (microcline)-quartz with coarse muscovite (5 to 7%) and garnet (1 to 3%). Some the potassium feldspar may be petalite and the outcrop has a weak tectonic overprint.

Sample AR02033: White pegmatite - anomalous Rb values (>400 ppm) and Cs (17 ppm)

Outcrop 5: White Pegmatite in Iron Formation

Pink, coarse-grained pegmatite composed of potassium feldspar (>70% microcline)-plagioclase-quartz overprinted by a weak tectonic fabric. A 4 m wide zone consisting of 70% iron formation can be traced along strike for 10 m. The pegmatite parallels the iron formation.

Sample AR02034: White pegmatite - anomalous Rb values (>400 ppm) and Cs (16 ppm).
Sample AR02035: White pegmatite - no anomalous rare-metal values

Previous and current sampling on the Nelly Lake property has demonstrated the enhanced potential for economic rare-metal mineralization. In particular

- elevated Rb and Cs in 7 of the 10 pegmatite samples, elevated Nb in 2 samples and highly elevated Ta in 1 sample, demonstrate the highly evolved nature of the pegmatite field;
- a 3 to 12% increase in SiO_2 was noted in the pegmatites in comparison to the proposed parental granite. Sample AR02027 had the highest elevated values for Rb-Cs-Nb-Ta and the highest silica content. High silica values may therefore be useful as an indicator for elevated rare-metal values;
- elevated Li was located in 3 samples east of Graphic Lake (Storey 1990).

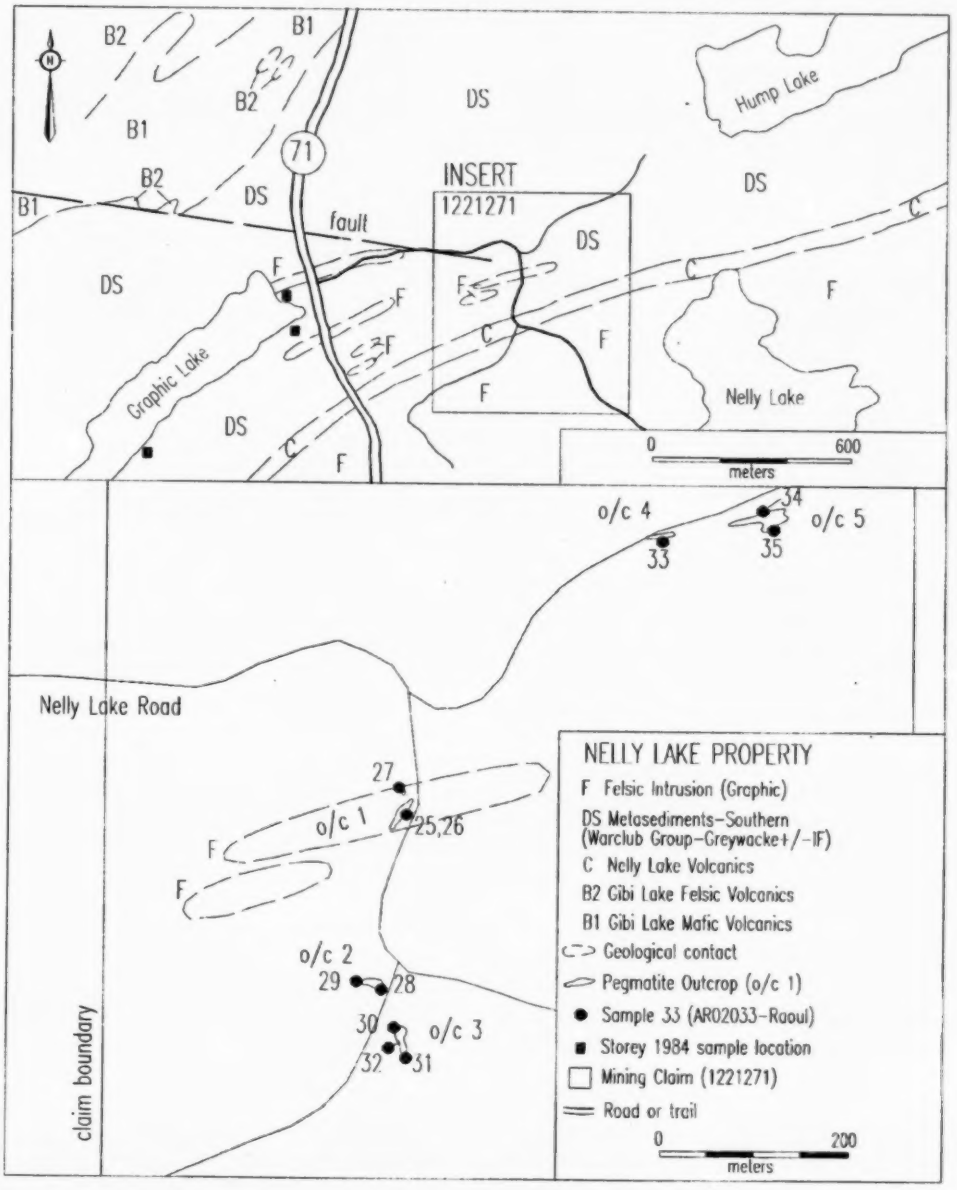


Figure 8. Regional geology of the Nelly Lake property (*modified after* Trowell 1986). Insert: Locations of claim 1221271 and sample locations of the Nelly Lake pegmatites.

ST. ANTHONY PROPERTY (C. RAVNAAS)

The St. Anthony property is located in the Sturgeon Lake–Squaw Lake area (NTS 52 J/02 SE), approximately 20 km southeast of the hamlet of Savant Lake. The property is located between the east shore of Sturgeon Lake and west shore of Couture Lake. Access to the property is by boat via Sturgeon Lake. An old road provides access to the mine site from the boat landing. Emerald Fields Resource Corporation own the mineral rights of the area examined.

Gold was produced at the St. Anthony Mine intermittently between 1905 and 1941. All production came from the No. 1 Vein system, which was mined over an approximate length of 305 m and to a depth of 230 m. An average recoverable grade of 0.19 ounces per ton gold was milled from 332 720 tons of rock. Production totaled 63 331 ounces gold and 16 341 ounces silver (Hogg 1981).

Table 11. Exploration activity conducted on the St. Anthony property.

Company	Year	Exploration Activity	Assessment File
St Anthony Mines Ltd.	1929 to 1939	GL	52J02SE 0120
St Anthony Mines Ltd.	1940 to 1941	DD surface and underground	52J02SE 0120
Con-Key Exploration Ltd.	1961	GL	52J02SE 0120
Con-Key Exploration Ltd.	1964	GL	52J02SE 0120
Con-Key Exploration Ltd.	1965	DD – 20 holes (2 to 21)	52J02SE 0120
Aubet Resources Ltd.	1981 to 1983	DD – 10 holes (SA 83-1 to 83-10), VLFEM, GM, GL, tailings sampling	52J02SE 082
Falconbridge Limited	1984	DD – 5 holes (84-1 to 84-5)	52J02SE 062A-1
Falconbridge Limited	1985	DD – 4 holes (85-6 to 85-9)	52J02SE 061D-1 062D-1 063E-1

DD diamond drilling, GL – geological mapping, GM – ground magnetometer, VLFEM – ground electromagnetic.

The area is underlain by rocks of the Northeast Arm volcanics, part of the Sturgeon Lake greenstone belt, Wabigoon Subprovince (Blackburn et al. 1991). The property area comprises foliated and gneissic, massive to pillowed mafic metavolcanic rocks of the Fourbay Lake assemblage (ca. 2775 Ma). These metavolcanic rocks are intruded by tonalite to granodiorite rocks of the Lewis Lake batholith (ca. 2730 to 2735 Ma, Sanborn-Barrie et al. 2002).

Evaluations of the St Anthony Mine have been presented by Moore (1911), Gledhill (1925), Graham (1930), Holbrooke (1964), Beaton (1975), Hogg (1981), Hinzer and Gill (1983) and Trowell (1983b). The gold potential of the quartz veins was the focus of all previous exploration work (Table 11).

The location and size of outcrops examined during the visit correspond to those presented in the detailed geology map of Holbrooke (1964) (Figure 9).

There are various interpretations on the formation of the St. Anthony Deposit, particularly the No. 1 Vein System. The following 3 excerpts represent opinions from the authors.

Hogg (1981) states:

> ...personal observations strongly suggest that the deposit is of detrital origin, the gold and sulphides having been originally concentrated in channels or basinal configuration on an Archean paleosurface. Siliceous metasediments, often strongly tuffaceous and carbonate-rich, and intercalated with basal material, probably formed primal host material. After deformation and metamorphism within this basinal accumulation produced variable recrystallization and remobilization resulting in the form and configuration of the vein system we see today.

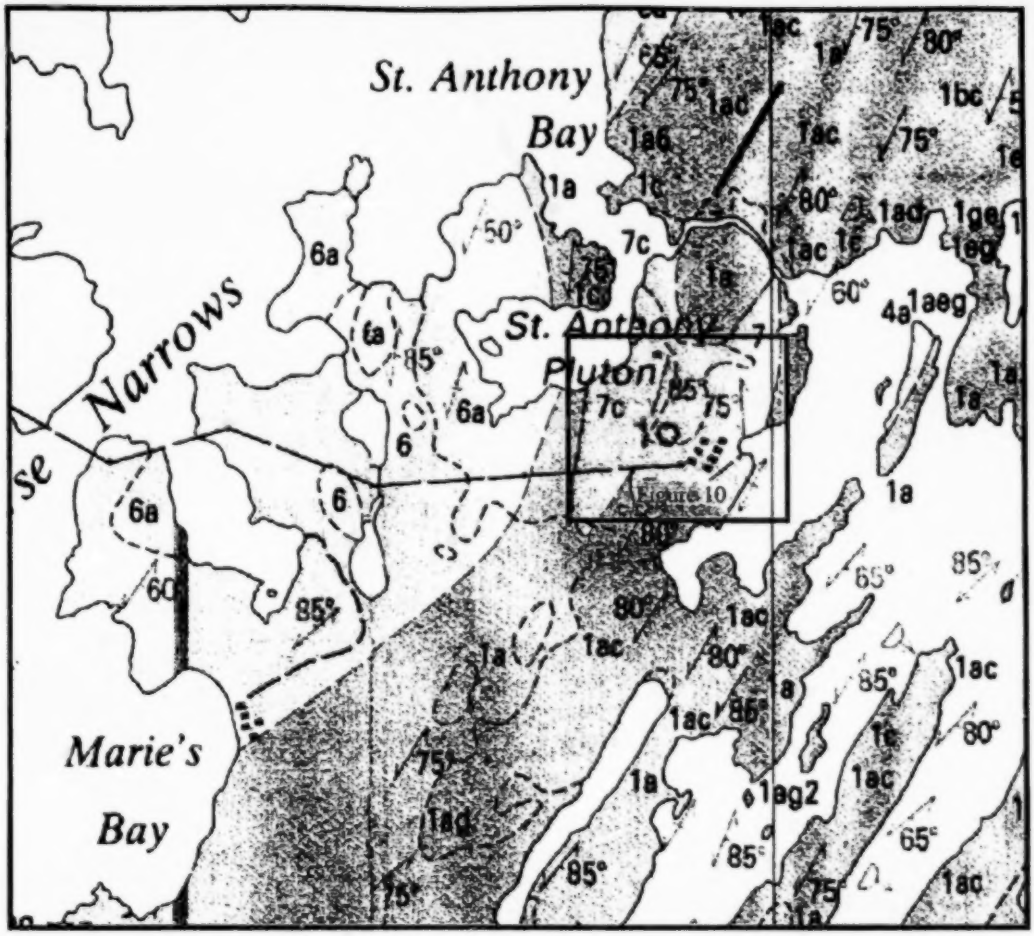


Figure 9. Geology of the St. Anthony property (*modified after* Trowell 1983a). Key to units: 1 - mafic metavolcanic rocks, 6 - batholithic-granitic complexes, 7 - trondhjemite-granodiorite intrusive rocks.

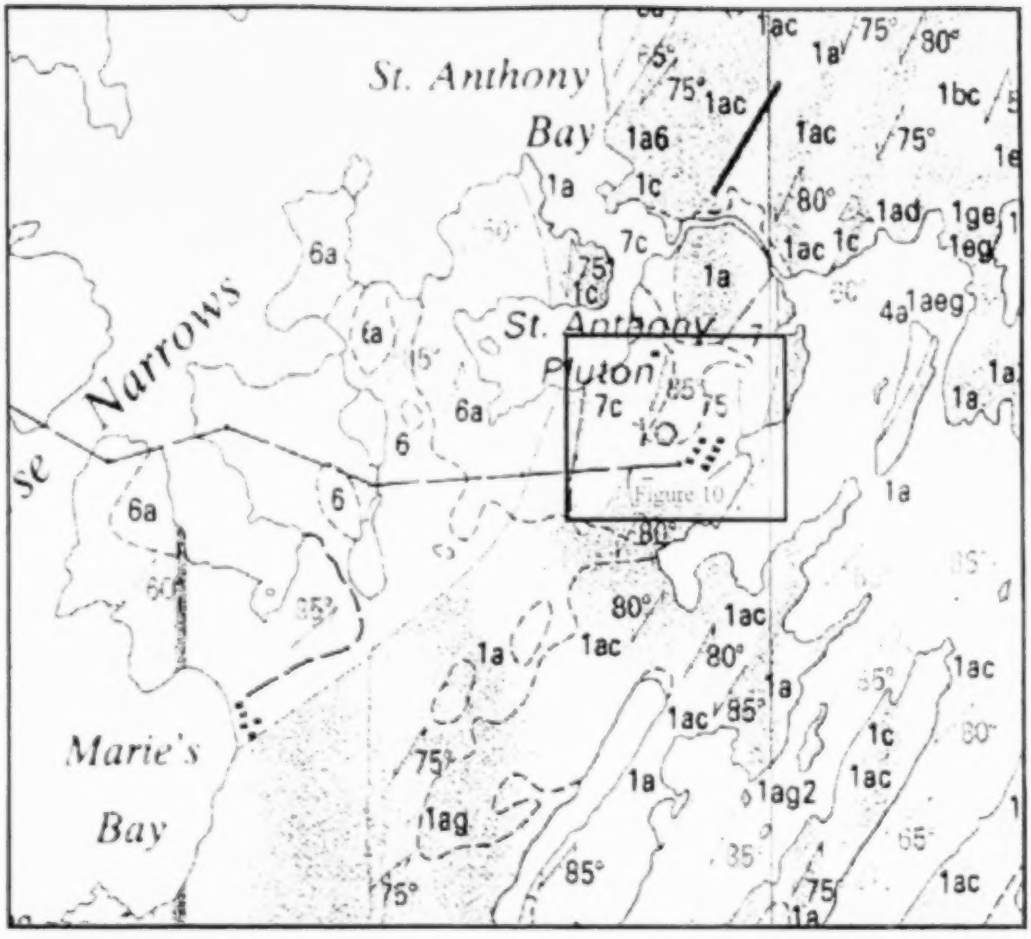
Hinzer and Gill (1983) state:

> The most massive quartz veining is observed in the No. 1 Vein System near the granite-andesite contact … where N-S shear zones and E-W structures intersect. The quartz veining thus appears to be controlled at least in part by the structure, the granite-andesite contact and the quartz porphyry. …a definite correlation between intersecting quartz veins and higher gold values and underground assay plans indicate that high grade gold mineralization is concentrated in local pockets along major vein structures – with intervening areas only bearing minor gold values for the No. 1 Vein System.

Trowell (1983b) states:

> Mafic rocks in general have a higher trace element content of gold than do felsic rocks and it may be that the ultimate source of gold was the mafic metavolcanics. Perhaps what is now the mineralized zone was originally a stratabound siliceous sulphide (pyrite, chalcopyrite, sphalerite, galena) carbonate Au-bearing zone (exhalite). The intrusion of the St. Anthony Pluton may have provided the necessary thermal energy, supply of volatiles including water, additional silica, and mechanical disruption of this stratabound unit to further concentration or upgrading of the gold values to produce a minable economic deposit.

Two general lithological units were examined, mafic metavolcanic and felsic intrusive rocks. The following describes selected exposures examined (Table 12; Figure 10) and significant analytical results (Table 13) that related to the objectives of the property visit.



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Two general lithological units were examined: mafic metavolcanic and felsic intrusive rocks. The following describes selected exposures examined (Table 12, Figure 10) and significant analytical results (Table 13) that related to the objectives of the property visit.

Mafic Flows

Mafic metavolcanic rocks, composed mainly of west-facing pillow basalt, underlie the south, east and west parts of the property. They are generally northeast trending and east dipping. Previous sampling by exploration companies did not target these mafic volcanic rocks even though north-trending quartz veins are present in certain areas. A 3 m wide siliceous zone, located approximately 40 m east of the St. Anthony pluton contact, contains quartz veins, altered basalt and tuffaceous rocks. A grab sample (SA13, Tables 2 and 3) of carbonate altered tuffaceous rock returned 2.11 g/t gold. The adjacent quartz vein assayed 23.28 g/t gold (sample SA12). Attempts to locate and examine additional quartz veins in the mafic flows in this part of the property were unsuccessful.

The mafic metavolcanic rocks west of the mine site area, adjacent to the boundary of the Lewis Lake batholith are moderately foliated, west dipping and altered. Sample SA22, a foliated-chloritic basalt, returned low, but anomalous (160 ppb), gold values. Other mafic metavolcanic exposures examined were void of sulphides and quartz veins and were not sampled.

Diorite Zone

A diorite sill intrudes mafic metavolcanic rocks 50 m south of the St. Anthony pluton. Hogg (1981) indicates the sill trends 030/65E. Assays of a sample from a Con-Key Exploration Ltd. drill hole returned 0.58 ounces per ton gold over 1.0 m in silicified mafic tuffaceous rocks and quartz veins on the west or footwall side of the diorite sill. A chip sample of this silicified zone (sample SA18) assayed 3.93 g/t gold over 3.0 m.

Felsic Intrusive Rocks

Holbrooke (1964) identified a majority of the exposures in the St. Anthony pluton as either quartz laced or sparse quartz granite. Hogg (1981) indicates samples of the silica-rich parts of the pluton returned low gold values. These exposures also lack the intensity of hydrothermal alteration that is commonly associated with the large quartz veins. Two quartz vein systems, the No. 1 and No. 2, cut the St. Anthony pluton and adjacent mafic metavolcanic rocks. Hogg (1981) describes the No. 1 system:

> The No. 1 Vein System is approximately 100 feet in length at surface, and has been mined over a length of 800 feet at the 750′ level. The structure strikes approximately N 20° E, and dips 73° W. ... the veining at surface commences in the greenstone area, extending northward about 400 feet to the granite contact area. It then follows the contact zone for about 200 feet, and extends into the granite for an additional 400 feet.

Currently, the best exposures are found in the northern parts of the vein system. Sphalerite, galena and sericite are associated with high gold values (Graham 1930). A grab sample (SA07) of the No. 1 Vein, containing sphalerite, galena and sericite, returned 44.90 g/t gold.

An auriferous alteration halo occurs around the No. 1 quartz vein system. This halo consists of sericite schist within the intrusive rocks and banded-carbonate-sericite schist within the mafic metavolcanic rocks (Graham 1930). Altered granodiorite (SA6A) returned 2.08 g/t gold, while the unaltered rock (SA6B) assayed 230 ppb gold.

Siliceous metasediment, often strongly tuffaceous and carbonate-rich are interpreted by Hogg (1981) as the primary host material for gold mineralization. Angular, iron-carbonate altered mafic metavolcanic boulders are located in the mine waste pile. Slab cuts of this rock revealed narrow white-coloured quartz veins paralleling tuffaceous bedding. The bedding and quartz veins are cut obliquely by narrow veins of calcite. A grab sample (SA14) of this fine-grained, bedded tuff returned 1.79 g/t gold.

Hogg (1981) describes the No. 2 quartz vein system:

> The No. 2 Vein System lies approximately 400 feet west of the No. 1 structure, and is parallel to it. The No. 2 system extends over an observed length of 700 feet, all within granite ... but is known to extend into th : greenstone area to the south.
>
> This system consists of quartz veins and stringers strongly developed over widths of at least 30 feet. ... The No. 2 Vein system strikes N 20° N and dips vertically to steeply west where observed.

Diamond drilling outlined the No. 2 quartz vein along a strike of approximately 185 m and to a depth of 200 m (Hinzer and Gill 1983). The exposure of the No. 2 quartz vein system that was examined and sampled during the

visit contained several parallel, 4 cm wide quartz veins across a 10 m wide zone. Hydrothermal alteration, although present, was not as intense as observed at the No. 1 quartz vein exposures. Grab and chip samples, SA15 and SA16 respectively, of this zone returned low gold values (*see* Table 3).

Analysis of samples collected during the property visit confirmed the gold values of known auriferous rock types. In particular, anomalous to high gold values are present in quartz veins, altered rock adjacent to large quartz veins and siliceous tuffaceous rocks. Examination of similar exposures on the property could identify new auriferous zones. The mafic flows, quartz porphyry, quartz laced and sparse quartz granite returned low gold values.

The accuracy of some analytical values should be interpreted with caution: Aubet Resources Inc. noted a high degree of variability between re-assays of drill core samples, which was attributed to the presence of free gold heterogeneously distributed in the rock (Hinzer and Gill 1983).

Table 12. Description of samples collected from the St. Anthony property.

Sample No.	Rock Type	Sample Location	Symbol on Holbrooke (1964) geology map and sample description
SA 01	Quartz porphyry	Small felsic intrusion	QP - foliated, moderately silica enriched with 1-3% fine-grained py and tr fine-to medium grained po
SA 02	Granodiorite - qtz	Adjacent to No. 1 vein	SQ - red-orange coloured feldspar and quartz, trace po, py
SA 03	Granodiorite	Adjacent to No. 1 vein	QLC - sample contradicts geology map: is not quartz vein laced, but unaltered granodiorite
SA 04	Quartz vein	No. 1 vein – north end	4 m long chip sample, white-green coloured, sericite quartz with 1% fine-grained py
SA 05	Quartz vein	No. 1 vein – north end	4 m long chip sample – description same as SA 04
SA 06A	Granodiorite	No. 1 vein – central part	QLC - adjacent to quartz vein, sericite-epidote quartz, with trace py
SA 06B	Granodiorite	No. 1 vein – central part	QLC - same exposures as SA 06A, but sample is void of alteration minerals, trace py
SA 07	Quartz vein	No. 1 vein – central part	Grab sample of main quartz vein with sericite-epidote, 1% py and trace sphalerite-galena
SA 08	Quartz vein	No. 1 vein – central part	5 m long chip sample, white quartz with 10% sericite
SA 09	Quartz vein	No. 1 vein – central part	5 m long chip sample - same description as SA 12
SA 10	Basalt-fresh	East of No. 1 vein	Adjacent to SA 09, typical basalt that is void of quartz, trace py and minor calcite
SA 11	Basalt-altered	East of No. 1 vein	Between to SA 08 and SA 10, 80% replacement of basalt by quartz-sericite, trace py
SA 12	Quartz vein	East of No. 1 vein	1.5 m long chip sample of quartz vein, trace py, minor basalt and tuff wallrock within in quartz
SA 13	Tuff-altered	East of No. 1 vein	Adjacent to SA 10, siliceous, minor calcite, 8% fine- to medium-grained cubic py
SA 14	Tuff-altered	Mine waste rock pile	1-2 cm wide quartz vein (void of calcite and py) along bedding. 1 cm wide calcite veins (1% fine grained py) cut quartz veins and bedding
SA 15	Granodiorite-altered	No. 2 vein zone – central part	QLC - adjacent to No. 2 vein. Sericite granodiorite, minor quartz in sample
SA 16	Quartz vein	No. 2 vein – central part	8 m long chip sample across quartz vein zone. Sample contains 20% white quartz and 80% silicified granodiorite
SA 17	Tuff-altered	Diorite Zone	Sample contains minor quartz and abundant carbonate alteration (50% calcite). Calcite veins cut bedding

Sample No.	Rock Type	Sample Location	Symbol on Holbrooke (1964) geology map and sample description
SA 18	Quartz vein and tuff	Diorite Zone	3 m long chip sample of quartz vein zone that contains 70% tuff (wallrock), 30% quartz and 10% calcite
SA 19	Quartz vein	Diorite Zone	2 m long chip sample of quartz vein zone that contains 90% quartz and 10% calcite
SA 20	Granodiorite-altered	West of No. 2 vein	QLC - yellow-green coloured, sericite with 5% fine-grained cubic py
SA 21	Granodiorite-fresh	West of SA 20	SQ - medium-grained, 5% fine-grained disseminated cubic py, minor po
SA 22	Basalt-altered	West of SA 21	GS - foliated, 5% calcite, minor quartz and chlorite, trace py
SA 23	Granite	West of SA 22	GG - part of Lewis Lake batholith, massive, equigranular, trace py

Table 13. Assay results of samples collected from St. Anthony property.

Sample	Rock Type	Au g/t	Ag g/t	As ppm	Cu ppm	Pb ppm	Zn ppm	Location UTM (NAD 83)	
SA 01	Quartz porphyry	0.27	<2.5	17.80	21.60	49.23	160	666674 E	5552876 N
SA 02	Granodiorite	0.44	<2.5	11.40	20.00	23.03	240	666635 E	5552946 N
SA 03	Granodiorite	1.47	<2.5	12.20	21.80	24.67	160	666619 E	5552969 N
SA 04	Quartz vein	3.95	<2.5	84.00	18.60	29.42	120	"	"
SA 05	Quartz vein	1.03	3.00	10.20	15.60	20.80	130	"	"
SA 6A	Granodiorite	2.08	<2.5	12.60	19.40	16.31	350	666627 E	5552877 N
SA 6B	Granodiorite	0.23	<2.5	14.60	15.38	12.80	100	"	"
SA 07	Quartz vein	44.90	22.00	7.80	14.00	1804.86	1500	"	"
SA 08	Quartz vein	3.64	<2.5	18.80	24.20	26.33	280	"	"
SA 09	Quartz vein	0.27	<2.5	116.00	17.60	34.96	120	"	"
SA 10	Basalt-fresh	0.28	<2.5	9.20	76.15	33.44	230	666666 E	5552793 N
SA 11	Basalt-altered	0.56	<2.5	8.00	46.60	22.55	180	"	"
SA 12	Quartz vein	23.28	<2.5	18.20	22.22	12.24	110	"	"
SA 13	Tuff-altered	2.11	<2.5	18.00	44.00	23.36	140	"	"
SA 14	Tuff-altered	1.79	<2.5	9.60	328.00	23.93	190	"	"
SA 15	Granodiorite	0.17	<2.5	22.00	34.00	20.16	180	666449 E	5552829 N
SA 16	Quartz vein	0.68	4.00	17.00	21.00	72.10	110	"	"
SA 17	Tuff-altered	0.67	<2.5	2.80	100.60	14.19	190	666518 E	5552651 N
SA 18	Quartz vein and tuff	3.93	<2.5	40.00	86.00	28.26	180	"	"
SA 19	Quartz vein	0.28	<2.5	10.40	19.00	10.23	100	"	"
SA 20	Granodiorite	0.44	<2.5	41.40	22.80	25.32	140	666422 E	5552871 N
SA 21	Granodiorite	0.40	<2.5	19.40	2.24	51.47	260	666382 E	5552865 N
SA 22	Basalt-altered	0.16	<2.5	9.60	19.44	26.05	190	666151 E	5552927 N
SA 23	Granite	0.23	<2.5	25.80	38.52	61.82	170	666032 E	5552878 N

Analysis by International Metallurgical and Environment Inc., Kelowna, British Columbia.

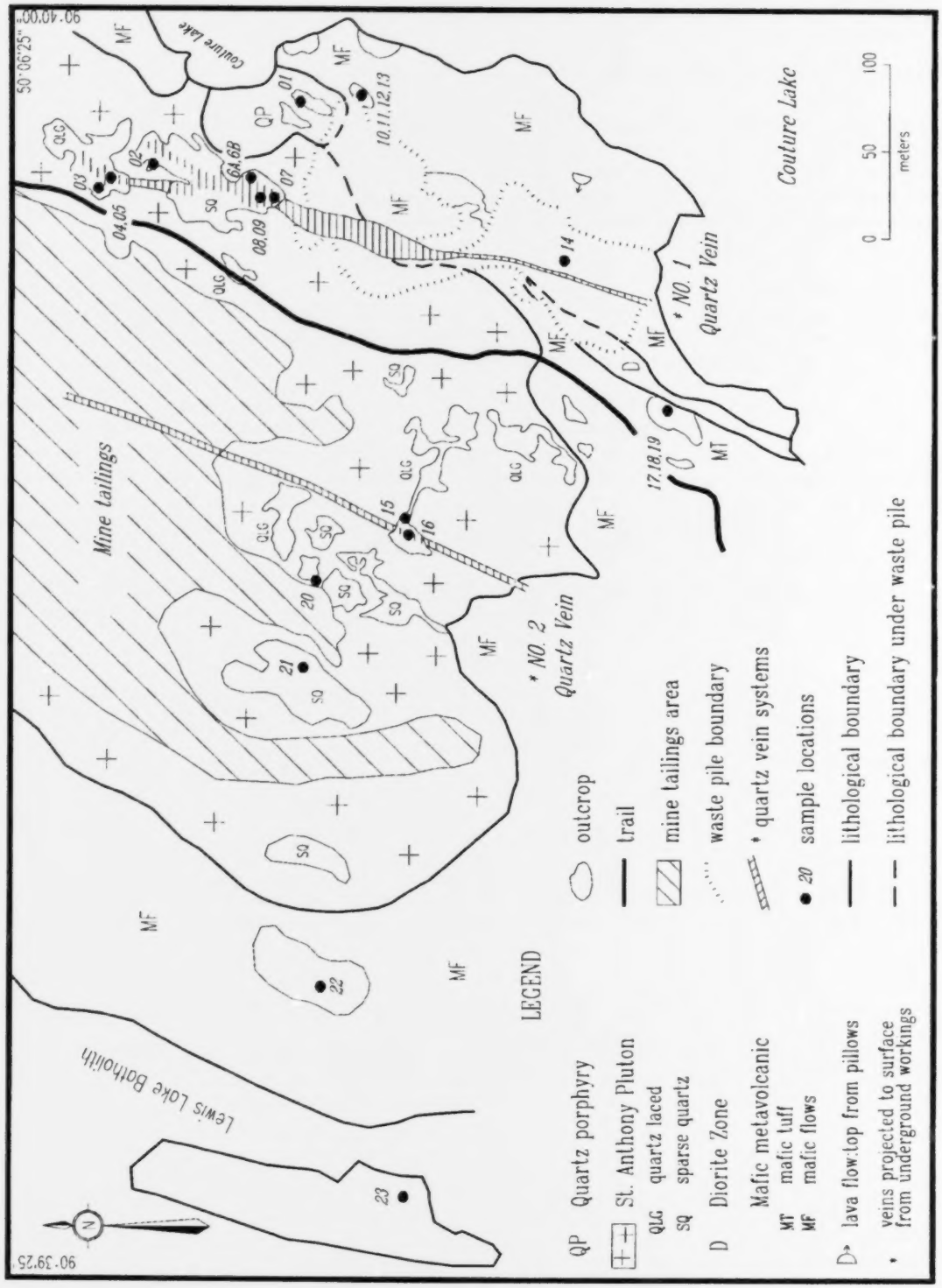

Figure 10. Geology and sample locations of the St. Anthony property (*modified after* Holbrooke 1964).

RECOMMENDATIONS FOR EXPLORATION

Lamprophyres in Kenora District

Thurston and Newsome (2002) present a predictive model for diamond-bearing rocks in Ontario. They conclude that specific structures, including Archean terrane boundaries, are spatially, and possibly genetically associated with kimberlites and alkaline magmatism. The Archean structures in the Kenora District identified, by the model include the Miniss River fault and the Archean fault coincident with the eastern portion of the western Wabigoon Subprovince boundary. The location of this boundary is approximately parallel with the eastern border of the Kenora District.

Thurston and Newsome (2002) state "All Archean terrane boundaries display evidence of Neoarchean sanukitoid suite monzodiorite to syenite bodies". In the Kenora District, these include the Sturgeon Narrows, Squaw Lake and Bell Lake alkalic rock complexes. Based upon this model, an elevated potential for new kimberlite discoveries exists in a 60 km buffer zone adjacent to these structures and lithologies.

Stott et al. (2002) observes that "the Wawa area has been the focus of exploration activity for diamonds in Archean mica- and actinolite-rich heterolithic breccias and associated lamprophyre dikes". Based upon field examination, Stott et al. (2002) suggest "heterolithic breccias and lamprophyric phases associated with late orogenic alkalic, and possibly sanukitoid intrusions, should be investigated for their diamond potential". Stott et al. (2002) also mention "the ultramafic phases of such late intrusions, which have attracted some attention for their platinum group element potential have not been suggested as possible carriers of diamond from the mantle. Exploration should be conducted on ultramafic intrusions, breccias and lamprophyre dikes in the vicinity of Archean alkalic plutons".

A compilation of all lamprophyre dikes illustrated on final and preliminary OGS maps was completed for the Kenora District. Table 14 presents a summary of all lamprophyre dikes identified during this review. Figure 11 illustrates the locations of the dikes, Archean alkalic plutons, possible sanukitoid intrusions and major Archean fault. The buffer zone established by Thurston and Newsome (2002) is also illustrated in the figure. There has been limited examination of these dikes and intrusions in the Kenora District, implying a significantly large area of terrane remains to be examined for diamond-bearing rocks.

Table 14. Lamprophyre dikes in the Kenora District.

No	Matrix of Dike	Type of Xenolith(s)	Host Rock	Reference	
				Report	Map
1	Unspecified	None reported	Metamorphosed coarse-grained sedimentary rocks (conglomerate) Metamorphosed granitoid rocks (tonalite)	GR 227	2525
2	Biotite	None reported	Metasedimentary rocks (biotite-quartz-feldspar schist)	GR 115	2279
3	Unspecified	None reported	Mafic intrusive rocks (hornblende gabbro)	GR 115	2278
4	Unspecified	None reported	Ultramafic to mafic metavolcanic rocks (ultramafic metavolcanics and fine-grained massive flows)	OFR 5804	P.3144
5	Unspecified	None reported	Mafic metavolcanic rocks (medium-grained massive amygdaloidal flows)	OFR 5710	P.3121
6	Rounded granitic to mafic inclusions	None reported	Mafic metavolcanic rocks (pillowed flows)	GR 280	2549
7	Mica-pyroxene lamprophyre	Biotite replaced hornblende crystals	Mafic metavolcanic rocks (mafic flows)	GR 201	2430 44e

No	Matrix of Dike	Type of Xenolith(s)	Host Rock	Reference	
				Report	Map
8	Medium-grained biotite-feldspar-quartz-pyroxene-mica lamprophyre	Potassic feldspar crystal	Felsic intrusive rocks (gneiss, migmatite)	GR 201	2430
9	Biotite lamprophyre	None reported	Clastic metasedimentary rocks (fine-grained arkosic wacke)	GR 222	2463
10	Biotite-rich lamprophyre	Amphibole phenocrysts	Felsic intrusive rocks (potassium-feldspar-megacrystic monzonite	GR 282	2567
11	Biotite-rich lamprophyre	None reported	Mafic intrusive rocks (quartz gabbro)	GR 282	2566
12	Biotite and amphibole with interstitial plagioclase	Biotite	Ultramafic intrusive rocks (peridotite)	GR 223 GR 202	2438 2476
13	Unspecified	None reported	Mafic metavolcanic rocks		47k
14	Unspecified	None reported	Mafic intrusive rocks	OFR 5659	P.2569
15	Unspecified	None reported	Felsic metavolcanic rocks		1950-2
16	1 to 3% biotite in a tremolite-plagioclase matrix	Granite and metasediment	Clastic metasedimentary rocks (greywackes)	GR 272	2534
17A	1 to 3% biotite in a tremolite-plagioclase matrix	Hornblende, metasediment and granite	Clastic metasedimentary rocks (greywackes)	GR 268	2528
17B	1 to 3% biotite in a tremolite-plagioclase matrix	Lapilli tuff	Felsic metavolcanic rocks (lapilli tuff)	GR 268	2528
18	50% chlorite, carbonate, plagioclase and quartz	Granite	Mafic metavolcanic rocks (porphyritic basalt) Clastic metasedimentary rocks (volcanic boulders and pebble conglomerate)	GR 101	2242
19	Biotite, sodic plagioclase, carbonate, apatite	None reported	Felsic intrusive rocks (trondhjemite and quartz diorite)	GR 101	2243
20	Unspecified	None reported	Alkaline intrusive rocks of the Bell Lake alkalic complex (biotite pyroxenite)	GR 24	2044W
21	Hornblende, biotite phenocrysts set in a fine-grained matrix of feldspar and quartz	None reported	Felsic intrusive rocks (migmatite and granitic gneiss)	GR 24 GR 114	2044W 2269
22	Unspecified	None reported	Mafic intrusive rocks (pyroxenite)	GR 24 GR 144	2044W
23	Unspecified	None reported	Mafic intrusive rocks (pyroxenite)	GR 24	2044W
24	Unspecified	None reported	Alkaline intrusive rocks of the Sturgeon Narrows alkalic complex (biotite-pyroxene syenite)	GR 154	2335
25	40 to 70% plagioclase and 25 to 60% biotite with 5% carbonate	Syenite	Alkaline intrusive rocks of the Sturgeon Narrows alkalic complex (nepheline-biotite-pyroxene syenite) Mafic metavolcanic rocks (flows)	Study 49 GR 154	Chart A 2335
26	Biotite lamprophyre	Metagabbro and quartz-feldspar porphyry	Mafic metavolcanic rocks peripheral to the Squaw Lake alkalic complex (flows)	Study 49	Chart A

GR-geological report, OFR-open file report, P-preliminary map

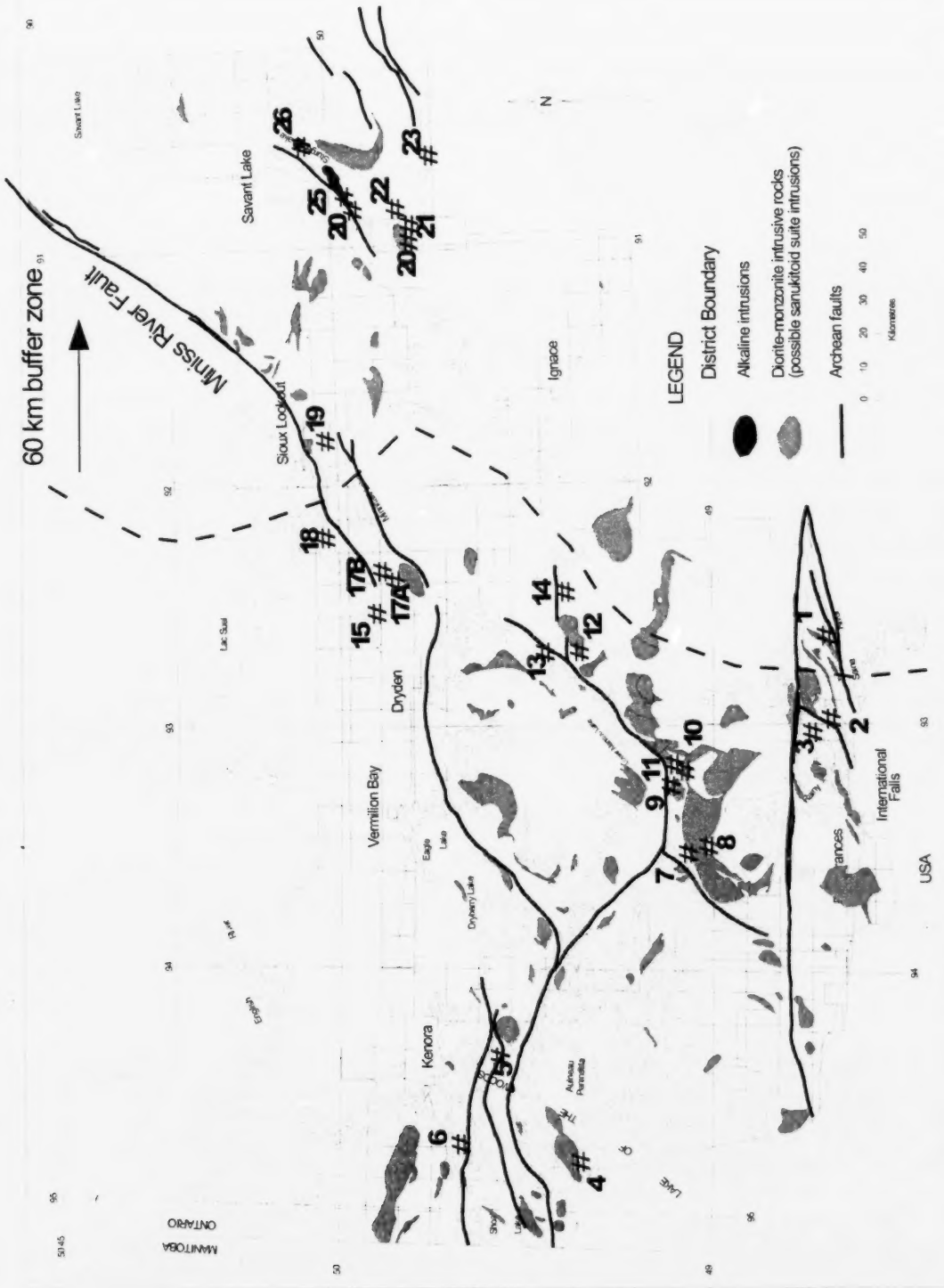

Figure 11. Location of lamprophyre dikes, Archean alkalic plutons, possible sanukitoid intrusion and major faults in the Kenora District (*modified after* OGS 1991).

Gold Mineralization in the Thunder Lake Assemblage

The search for gold mineralization in the western Wabigoon Subprovince has been continuous since the 1880s, however, this search was restricted to quartz veins and shear zones. In 1982, the discovery of the world-class Hemlo deposit (80 Mt @ 7.7 g/t Au) led to the development of a new model for gold deposition and the search for "Hemlo-type" ore deposits.

In the 1990s, 2 gold discoveries were made in the Warclub group metasediments and volcanics, near Dryden, Ontario. From 1990 until 1998, partners Teck Corporation and Corona Gold Corporation discovered, explored and developed the Thunder Lake Gold project. The deposit is estimated to contain a resource of 3.78 Mt @ 7.02 g/t gold (Teck Corp., news release, April 20, 1998). Between 1994 and 1996, Champion Bear Resources Limited developed the Plomp Farm property. The gold-bearing zone averaged 17 m in thickness and was traced along strike for 1.6 km, and drilled to a depth of 820 m. Assays range from 0.05 to 14.36 g/t gold with the average grade between 0.3 and 0.5 g/t gold, with several higher grade zones occurring within the mineralized package (Champion Bear Resources Ltd., news release, August 23, 1996).

STRUCTURE AND ALTERATION

In the Thunder Lake area, structural features include a well-developed earlier (D_1) fabric in the quartz porphyritic felsic volcanic rocks (Thunder Lake volcanics) with concordant quartz veins (070°), that are locally deformed into z-asymmetric folds. A weakly developed second (D_2) fabric is evident, with concordant quartz veins (050°) approximately parallel to the axial surfaces of the folds. These quartz veins postdate the mineralization and usually have poor gold values (Beakhouse 2002).

In the Thunder Lake area, the D_2 fabric was a result of northwest-directed compression; the D_2 quartz veins were a result of northwest-directed extension. The parallel nature of the fabric and the veins suggests that the veins were emplaced following the main D_2 event (Beakhouse 2002). This relationship is similar to that occurring at Hemlo where feldspar porphyry dike swarms are oriented parallel to a late fabric. Constraints on the timing of mineralization at Hemlo are permissive of the hypothesis that this transient extensional phase may have decreased fluid pressure and led to the ingress of the mineralizing fluid followed by the dike magmas, which effectively sealed the system. If this hypothesis is correct, it may mean that even where swarms of extensional veins and dikes are not mineralized, they may be a guide to areas favourable for mineralization (Beakhouse 2002).

Although Plomp Farm mineralization has limited surface exposure, a well-developed fabric, interpreted as D_1, is observed in the host felsic volcanic rocks. Associated z-folded quartz veins trend 065 to 080°. A second, weaker fabric, interpreted as D_2, overprints the first fabric; associated quartz veins trend 030 to 065°. Feldspar porphyry dikes parallel and cut both fabrics. Their presence and similar orientation to fabric suggests a similar history to the Thunder Lake deposit.

In summary, a postulated series of events in the Thunder Lake assemblage includes (Beakhouse 2002)

1. D_2 compression and z-fold development (local and regional)
2. D_2 extension and quartz vein development. These sealed the area after the mineralizing event

COMPARISON OF THE GOLD DEPOSITIONAL ENVIRONMENT OF THE THUNDER LAKE ASSEMBLAGE

The following criteria (Beakhouse 2000) are believed to be important for gold mineralization in zones of lithological and structural heterogeneity:

1. an association with felsic volcanic lenses in a dominantly sedimentary belt;
2. heterogeneous strain, due in part to ductility contrasts between rock units;
3. occurrence in a regional-scale flexure of both stratigraphic and penetrative fabric define by peak metamorphic mineral assemblages;
4. proximity to the greenschist-amphibolite regional metamorphic transition;
5. evidence for a late extensional episode;
6. association of gold with sulphide deposition.

The Thunder Lake assemblage meets the preceeding criteria, specifically:

1. Gold mineralization at the Thunder Lake Deposit and on the Plomp Farm property occurs as disseminated and vein-type within an altered felsic volcanic-metasedimentary package. A thick sequence of iron formation occurs in the footwall of both deposits.
2. A D_1 deformational event is evident in brittle fracturing of the felsic Thunder Lake volcanics, and the more ductile deformation of the Thunder Lake sediments. Mafic volcanic rocks (Brownridge and Thunder River volcanics) are more homogeneous and appear less deformed by the D_1 event.
3. The hydrothermal fluid that is associated with alteration and gold mineralization is related to the D_1 event. This introduction is at the later stage of the deformation event. The trend of the D_1 is 070° with quartz veins being a pronounced feature of this syngenetic D_1 event.
4. The Thunder Lake assemblage is interpreted to be low to middle amphibolite grade based upon the north-facing garnet-corderite-sillimanite mineral assemblage. The deposits are located within 5 to 6 km of the greenschist-amphibolite transition.
5. Late extensional fabric and quartz veins are related to a D_2 deformational event trending 050°.
6. Gold mineralization, if present in these quartz veins, is a product of remobilization from existing mineralized zones.
7. Significant gold mineralization is associated with silicification (silica or quartz), sericitization, pyritization and the formation of barium-microcline.
    - In the Thunder Lake deposit, lower grade mineralization (<3 g/t Au) is associated with 2 to 5% disseminated pyrite, whereas higher grade zones (>3 g/t Au) are associated with elevated Zn or Cu values.
    - At the Plomp Farm, drill core samples from base metal-mineralized alteration zones (Lichtblau et al. 2002) returned 53.5 g/t gold with 0.19% Zn in sphalerite-bearing quartz sericite schist and 92.7 g/t gold with 0.42% Cu in chalcopyrite-bearing quartz sericite schist. Six samples that contained >1% BaO also had elevated gold (>0.6 g/t). A direct correlation between the introduction of barium-bearing hydrothermal fluids and the gold mineralizing event is indicated.

The Thunder Lake assemblage has potential to host these gold-bearing units of altered felsic volcanic rock (Figure 12). Interpretation of the airborne magnetic response (OGS 1991) by this author confirms that the iron formation, which underlies the felsic volcanic packages, can be traced over a 70 km strike distance. Indicators for gold mineralization are: elevated BaO values, the presence of Cu-Zn sulphides and the presence of sericite-silica alteration in this felsic volcanic unit.

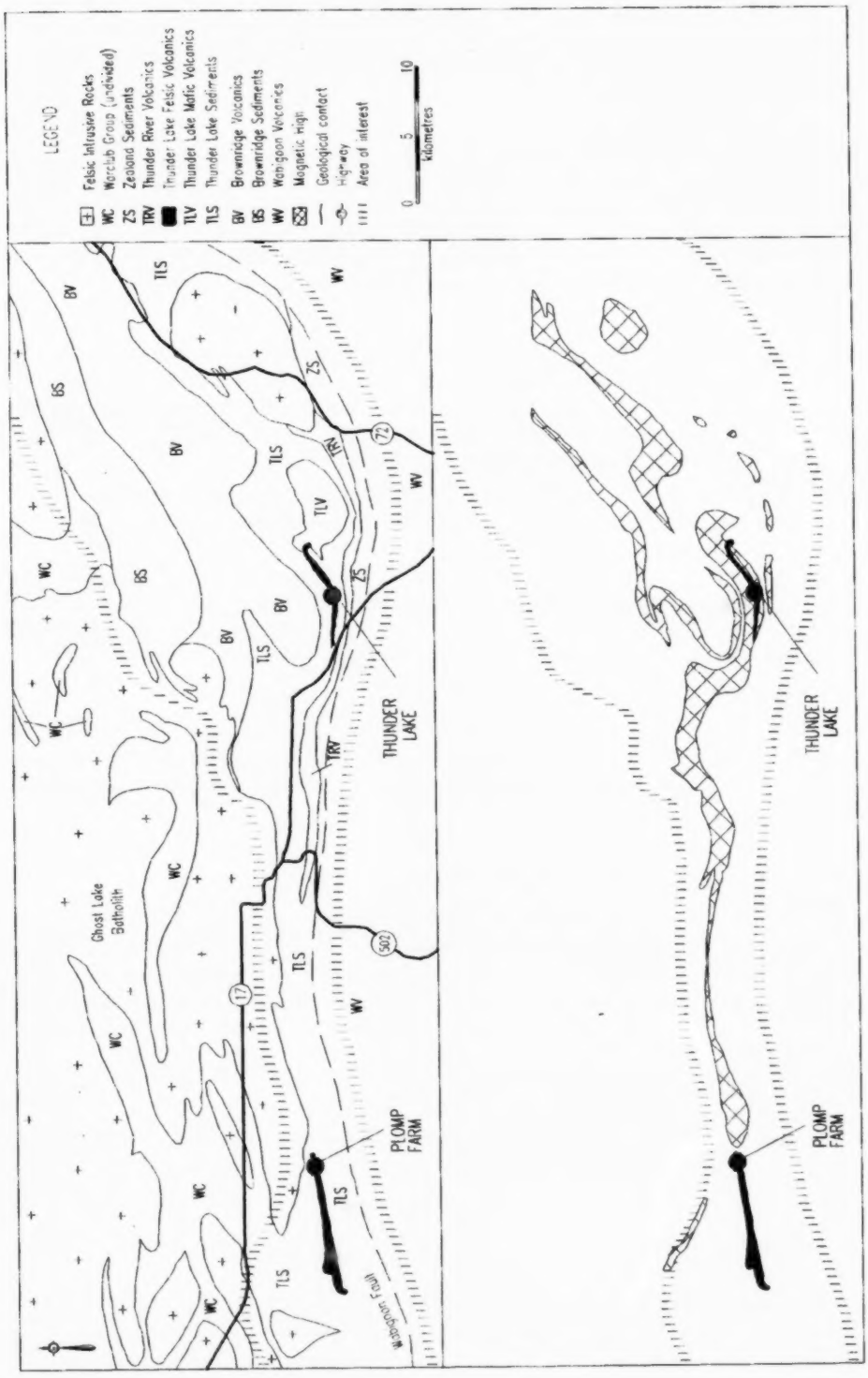

Figure 12. Gold potential of the Thunder Lake assemblage in the Warclub group.

OGS ACTIVITIES AND RESEARCH BY OTHERS

Four Ontario Geological Survey (OGS) field projects were undertaken and one OTH airborne magnetic and electromagnetic survey was completed in the Kenora District in 2002. Figure 13 illustrates the location of 3 of these projects.

A) The OTH airborne magnetic and electromagnetic survey for the Stormy Lake area was released in March 2002. The area was flown using a fixed-wing aircraft mounted with MEGATEM time-domain airborne electromagnetic, GEOTEM digital time-domain electromagnetic and total field magnetometer instruments. A total of 33 875 km of flight lines were flown at 200 m spacing intervals. The area between Eagle Lake and Ignace was covered; flight direction was dependant upon geological contacts. Thirty-five coloured maps at a scale of 1:50 000 were released as part of this survey (Maps 82 178 to 82 213).

B) G.P. Beakhouse, Precambrian Geoscience Section, OGS, completed the third year of a five-year project mapping the Dinorwic Lake segment of the Wabigoon area.

C) G.P. Beakhouse, Precambrian Geoscience Section, OGS, and R.A. Creaser, Department of Earth and Atmosphere Sciences, University of Alberta, Edmonton, completed a preliminary assessment of isotopic characteristics of plutons within the Western Wabigoon Subprovince.

D) P.C. Thurston, Mineral Exploration Research Centre, Department of Earth Sciences, Laurentian University, and J. Newsome, Resident Geologist Program, Sudbury, completed a predictive model for diamond-bearing rocks in Ontario.

E) D.F. Russell, Sedimentary Geoscience Section, OGS, completed fieldwork for a high-density lake sediment and water geochemical survey in the Eagle Lake area.

Table 15. Publications received by the Kenora Office in 2002.

Title	Author	Type and Year of Publication
Canadian Shield	Geological Survey of Canada	GSC Current Research 1998-C, 189p., 1998
Granite-greenstone relationships at the southern Sturgeon belt margin in the Brightsand forest area, Ontario	Brown, J.L., Percival, J.A., White, D., Tomlinson, K.Y. and McNicoll, V.	GSC Current Research 2000-C19, 10p., 2000
Samuels Lake Intrusion: a Late Archean Cu-Ni-PGE-bearing mafic-ultramafic complex in the western Quetico Subprovince, Northwestern Ontario	Pettigrew, N.T., Hatorri, K.H. and Percival, J.A.	GSC Current Research 2000-C20, 8p., 2000
Structural analysis of lode gold deposits in deformed terranes	Robert, F., Poulsen, K.H. and Dubé, B.	GSC Open File 2850, 139p., 1994
1996 Lithoprobe Western Superior Seismic Refraction Survey: Field Acquisition and Processing Report	Asudeh, I., White, D., Roberts, R., Forsyth, D., Kay, I., Cartwright, T., Carroll, P., Hajnal, Z., Koperwhats, B., Musacchio, G. and Farrell, D.	GSC Open File 3583, 223p., 1999
Geology, South Central Sturgeon Lake Area	Morton, R.L., Hudak, G. and Franklin, J.M.	GSC Open File 3642, scale 1:15 000, 1999
Regional Lake Sediment Geochemical Reconnaissance Data	Geological Survey of Canada	GSC Open File 676, 49p., 1979
Geology and Tectonostratigraphic Assemblages, Western Wabigoon Subprovince, Ontario	Sanbon-Barrie, M., Skulski, T., Percival, J.A., Whalen, J.B., Brown, J. and McNicoll, V.	Map P. 3446, GSC Open File 4255, scale 1:250 000, 2002

Title	Author	Type and Year of Publication
Geology and Tectonostratigraphic Assemblages, North-Central Wabigoon Subprovince, Ontario	Percival, J.A., Whalen, J.B., Tomlinson, K.Y., McNicoll, V. and Stott, G.M.	Map P. 3447, GSC Open File 4270, scale 1:250 000, 2002
Geology and Tectonostratigraphic Assemblages, South-Central Wabigoon Subprovince, Ontario	Stone, D., Tomlinson, Davis, D.W., Fralick, P., Hallé, J., Percival, J.A. and Pufahl, P.	Map P. 3448, GSC Open File 4284, scale 1:250 000, 2002
Wawang–English River Lake Sediment Survey, Northwestern Ontario: PGE Data and Final Results/Interpretation of Lake Sediment Geochemistry	Dyer, R.D.	OFR 6076, 70p., 2002, with P. Maps 2672, 2673, 2674 and 2675
Report of Activities 2001, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	Lichtblau, A., Hinz, P., Ravnaas, C., Storey, C.C., Kosloski, L. and Raoul, A.	OFR 6079, 125p., 2002
Report of Activities 2001, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	Mason, J.K., White, G.D., Scott, J.F., O'Brien, M.S. and Komar, C.	OFR 6080, 39p., 2002
Report of Activities 2001, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C., Parker, D.P. and O'Brien, M.S.	OFR 6081, 45p., 2002
Report of Activities 2001, Resident Geologist Program, Regional Land Use Geologist Report: Northwestern, Northeastern and Southern Ontario Regions	Debicki, R., Drost, A., Rowell, D. and Yule, G.	OFR 6085, 17p., 2002
Sturgeon Lake – Lake St. Joseph Area Lake Sediment Survey: Operation Treasure Hunt	Russell, D.F., and Jackson, J.E.	OFR 6087, 199p., 2002
Perrault Falls Area High Density Regional Lake Sediment Geochemical Survey, Northwestern Ontario: Operation Treasure Hunt	Ontario Geological Survey	OFR 6092, 84p., 2002
Summary of Field Work and Other Activities	Baker, C.L., Debicki, E.J., Kelly, R.I. and Parker, J.R.	OFR 6100, 353p., 2002
Institute on Lake Superior Geology – Kenora Ontario	Minnesota Geological Survey	48th Annual Meeting, Parts I and II, 2002

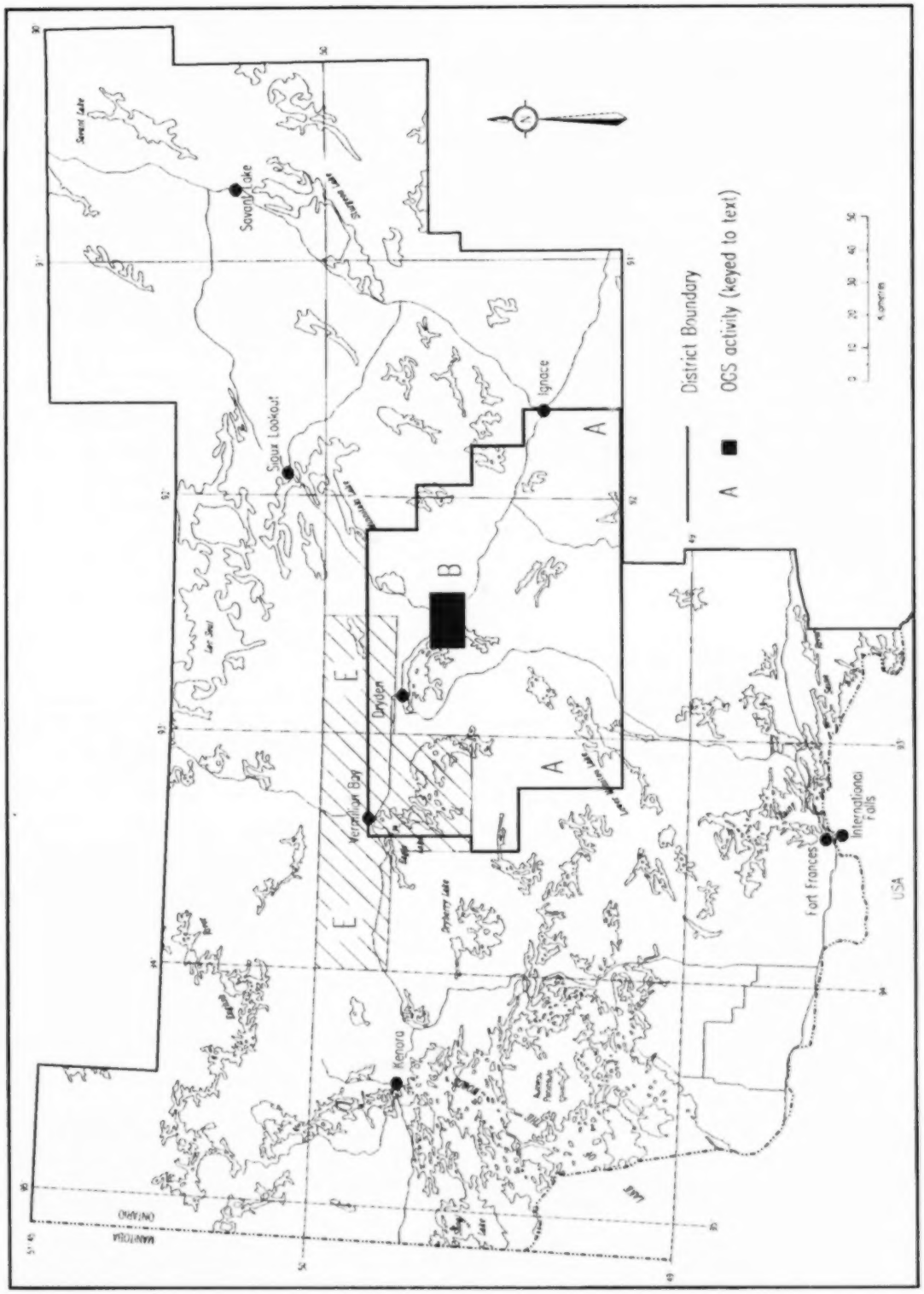

Figure 13. Location of OGS activities in the Kenora District in 2002.

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Table 16. Mineral deposits in the Kenora District 2002.

Abbreviations

AF ..... Assessment Files
CMH ..... Canadian Mines Handbook
GR ..... Geological Report
MDC ..... Mineral Deposit Circular
MDIR ..... Mineral Deposit Inventory record
ROA ..... Report of Activities
MLS ..... Mining Lands, Sudbury
MR ..... Mining Recorder
NM ..... The Northern Miner
OFR ..... Open File Report
PC ..... Personal Communication
SMDR ..... Source Mineral Deposit Record

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Apex Occurrence (52F/5NE)	Cu, Ni	Zone : 110m x 4m x 180m Est. Resource : 237,600 t @ 1.03% Cu and 0.56% Ni.	J. Clark	GR 111, p.40	Staked claim K1239515
Avery Township (Melgund Lake) (52F/9NW)	Ballast	Quarry : 160m x 90m x 15m Est. Production : 648,000 t Reserves : open	CPR	OFR 5680, p.9 MDC 27, p.11	Inactive quarry, Under W.L.L. C-2311
Bad Vermilion Lak – Seine Bay Prospect (52C/10NE)	Fe, Ti, V	Resource : 1,270,000 t of 15% TiO_2 and 45% Fe. Potential for 177,800 t of titanium sponge	CMH, 1995-96, Stephanna Resources	NM 08/15/85, p.3 (Beaver Energy Resources)	Inactive, 8 claims
Bannerman and Horne (52G/5NW)	Stone	Quarry 1 : 60m x 5m (max) Produced : unknown Reserves : open	Unknown (formerly CPR)	MDC 27, p.18	Inactive quarry, Patent SN38
Barwick Peat (Arctic Peat) (Peatland R-20/21) (52C/12NE)	Peat	Area : 790 Ha at 2.85m thick Est. Resource : $22.5x10^6$ m^3 Production (78-83) : n/a Production (93) : 164 t Reserves : open	Unknown	OFR 5489, Vol.8, p.6-13 ROA 1979-1983 ROA 1994	Inactive operation, Patented land and Open Crown Land
Bending Lake Prospect (52F/8SE)	Fe	Main Zone : 1500 m long x 300m wide at unknown grade (average of 34% Fe found by RGP staff, ROA 2000). Open pit reserves sufficient to maintain plant output of 2 Mt for 20 years.	LTV Steel	MDIR NM 14/04/77 (LTV Steel) OFR 6047, p.19 Table 16	Inactive, 70 patented claims MDIR file - K0133
Big Master (Kenwest Mine) (52F/7NE)	Au, Ag	Produced : 2,565 oz Au and 184 oz Ag from 14,470 tons. Indicated 1967 drilling: 30,000 t @ 0.36 opt Au. Old workings : 19,000 t @ 0.30 opt Au. Proven & Probable: 123, 000 t of 0.30 opt Au and Indicated: 600,000 t of 0.22 opt Au.	Goldcorp. Inc., Toronto; c/o David Sannes PC	MDC 16, p.9 CMH, 1988-89, p.92 (Canamerica Precious Metals Inc.)	Inactive, patented claims HP366, HP373, HP301

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Big Whopper Pegmatite (52 L/07SE)	Li, Cs, Rb	Preliminary resource estimated at 11.6 Mt averaging 1.34% Li_2O and 0.30 Rb_2O.	Avalon Ventures	CMH, 2000-2001, p.45 (Avalon Ventures Ltd.)	Active, 12 staked claims.
Bonanza Mine (52F/10NW)	Au	Reserves : 5,000 t of 0.25 opt Au across a width of 0.3m.	CMH, 1994-95, p.386 (Wiscan Resources Inc.)	Van Horne Gold Expl. Inc. AF	Inactive, 59 claims K53304 (site)
Bonheur Quarry (52G/6SW)	Ballast	Produced : 3 quarry sites for 57,750 m^3 (pre-1937). Reserves : open	CPR	MDC 27, p.19	Inactive quarry, Patent TT25
By-Pass Gneiss (52E/15SE & 52E/16SW)	Aggreg.	Production : 2 sites used for the construction of Hwy 17A with unknown volumes. Reserves : closed	MTO	PC: MTO Staff	Inactive sites, Open Crown Land
Cameron Lake Deposit (52F/5SE)	Au	Resource : proven, possible and probable: 3,160,148 tons of 0.168 opt Au	CMH, 1995-96, p.275 Nuinsco Resources	CMH, 1995-96, p.275 Nuinsco Resources	Care and maintenance, 61 leased claims
Canadian Arrow Prospect (Dogpaw Lake) (52F/5SW)	Au	Indicated Reserves: 96,650 tons of 0.43 opt Au in 2 veins.	CMH, 1999-00, p.94 (Canadian Arrow Mines Ltd.)	NM 4/5/61 (Consolidated Golden Arrow Mines Ltd.)	Inactive, 17 claims
Canamerica E Zone (52F/7NE)	Au	Resource: 455 000 t of 0.117 opt Au indicated and inferred. Resource : 529 650 t of 0.103 opt Au indicated and inferred.	CMH, 1999-00, p.316 (Co-Maxx Energy Group Inc.)	NM 07/13/87, p.17 (Canamerica Precious Metals Inc.) Cochrane Oil & Gas Ltd., AF	Inactive, 45 claims
Cates Occurrence (52F/13SE)	Zn, Ag	Zone : 2,700m by 12m by 60m Reserves : 5.83 Mt @ 0.5% Zn and 0.5 opt Ag.	R. Fairservice	AF 52F/13SE M-1 to M-6 (Noranda) AF 52F/13SE B-1 to B-6 (Rio Algom)	Active, 9 claims
Cedar Island Deposit (Cornucopia) (52E/10SW)	Au	Production : 4,941 oz Au and 3,884 oz Ag from 17,050 tons. Preliminary reserves: 1,234,069 tonnes of 9.62 g/t Au (both Cedar Island and Mikado)	CMH, 1995-96, p.220 (Kenora Prospectors and Miners Ltd.)	MDC 16, p.13 CMH, 1995-96 p.220	Inactive, patented claims D212, D265
Coldspring Granite – Havik Lake Quarry (52L/1SW)	Stone	Produced : 3,388 m^3 (97-99) Reserves : open	Coldspring Granite	ROA 1998-2000	Active Quarry, Claims 1160899-1160901, 1160905
Coldspring Granite – Pale Green Quarry (Palin Granite) (52L/1SW)	Stone	Produced : 6,169 m^3 (92-98) Reserves : open	Coldspring Granite with surrounding claims by C. Nelson	ROA 1993-1999	Inactive Quarry, Lease CLM 418 and 13 Claims.
Coste Island Prospect (52E/7NE)	Soapstone	Zone : 600m long x 64m wide Production : unknown Reserves : open	West half under W.L.L. P2379 and East half under E2376W.	MDF 52E/7NE (Coste Island) MDC 27, p.80	Inactive, OLL and Enhanced Land Management
Crystal Quartz Canada (Crystal Quarries) (52F/11SW)	Silica	Production : 25,759 t (91-95) Reserves : unknown	Crystal Quarries (Crystal Quartz Canada)	ROA 1991-1995	Inactive, 8 claims

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Cygnet Lake Quarry (52L2/SW)	Stone & Aggreg.	Produced : 12,780 t (1992-95) Reserves : open	A. J. Minor & Sons	ROA 1992-1995	Inactive Quarry, Claims 1221219 and 1221220.
Dobie Deposit (52D/12NW)	Cu-Ni	Resource: 5.0 Mt @ 0.28% Cu and 0.24 % Ni	Nuinsco Resources and IR 11 (Manitou Rapids)	AF 52C/12NW B-3	Inactive, Patented landed and Reserve.
Dubenski Gold Prospect (52F/05SW)	Au	Drill-indicated resource of 355 286 tonnes grading 6.32 g/t calculated to a depth of 150 m.	P. Dubenski, Kenora PC	CMH, 1999-00 p.52 (Avalon Ventures)	Inactive, 22 Leased claims.
Duport Mine (Cameron Island) (52E/11SE)	Au	Total geological reserves: 2.0 Mt of 0.35 opt Au. Proven and Probable: 944,000 t of 0.39 opt Au at 450 tpd. Estimated pre-production cost $52.8 million.	Unavailable	CMH, 1995-96 p.111 (Consolidated Professor Mines)	Active, Patented claims S.170, K1332, K1333, K2374
Dyment Quarry (52F/9NE)	Aggreg.	Produced : 1.29 Mt (1993-95) Reserves : open	Unknown (CPR via Broda Construction)	ROA 1993-1995	Inactive quarry, Patented land Lot 3 & Concession 5 of Melgund Twp.
Eagle Lake Soapstone Quarry (52F/11NW)	Soapstone	Produced : 174 t (1925-26) Produced : 547.5 t (1993-2000) Reserves : open	Phil Thorgrimson	MDC 27, p.81 ROA 1994-2000	Active, Patented claim 1169628
Eagle Rock Prop. (Campbell Zone) (52F/2NE)	Au, Pt, Pd, Cu	Resources of 45m wide by 1000m long at 1.2 g/t Au-Pt-Pd, 4.8 g/t Ag and 0.5% Cu	Champion Bear Resources Ltd.	Press Release 2001-02-27 (Champion Bear)	Active operation, 28 claims
Electrum Prospect –W Zone (Fault zone or West Zone) (52E/11 NE)	Au	Zone : 61m x 2.1m x 19.8 m averaging 0.23 opt Au. Reserves : 100 000 tons of 0.33 opt Au in the P and W zones combined.	Celyn Alcock, Kenora, Ontario	OFR 5695, p.108 Laramide Resources Inc. Annual Report, 1987	Inactive, Patented and Leased claims K20696-K28663
Elora (Jubilee) (52F/7NE)	Au	Produced : 1,370 oz Au and 296 oz Ag from 13,766 tons Resource (Au) : Probable 13,500 t @ 0.18 opt Possible 215,000 t @ 0.18 opt Speculative 5,000 t @ 0.10 opt from the dump.	Unknown	MDC 16, p.15 OFR 5332, p.37 Table 8	Inactive, Patented claim HP 301
Evenlode Prospect (Eco Occurrence) (52E/11NE)	Mo, Au	Resource : 126,000 t @ 0.68% MoS_2 and 0.015 opt Au. Indicated: 200,000 t of 0.63% MoS_2 Inferred: 550,000 t estimated to a depth of 800 feet.	Patented claims – D. Smerchanski. Staked claims – D. Meek	OFR 5695, p.114	Inactive, patented claims K8705, K8707 and staked claims 1229467, 1229468
F-Group (52G/14SE)	Cu, Zn, Pb, Ag	Original Resource (Dec/ 78): 0.63 Mt @ 8.10% Zn, 0.98% Cu, 0.49% Pb, 1.80 opt Ag. Reserves (Dec/82): 0.20 Mt @ 8.20% Zn, 0.80% Cu, 0.60% Pb, 1.80 opt Ag	Noranda	CMH 1979-80, p.194 (Noranda) CMH 1982-83, p.254 (Noranda)	Inactive, Patented claims PA312564-65, PA 312567-68 and PA226490-91.
Farlane (52L/1SW)	Stone, Aggreg.	Production: unknown volumes (sites 1 & 2 for stone and sites 3 & 4 for aggregate). Reserves : open	Open Crown Land (formerly CNR)	MDC 27, p.25	Inactive Quarry, Open Crown Land

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Flambeau Lake Prospect (52F/10NW)	Au	Resource : diamond drilling partially outlines a zone with potential for 572,000 tonnes (Au grade unstated).	Alex Kozowy, Dryden, PC	AF 52F/10NW UU-1 and UU-2	Inactive, Patented claim AL88
Foley Mine (52C/10NE)	Au	Produced : 855 oz Au and 149 oz Ag from 5,568 tons. Reserves : 40,000 tons @ 0.5 opt Au proven/probable and 400,000 tons @ 0.5 opt Au speculative.	R. Cone, Fort Frances	MDC 16, p.16 NM 09/25/80 Seaforth Mines Ltd. OFR 5539, p.194	Inactive, Patented claims K475101, K475102, K475103
Gaffney Prospect (52F/7SW)	Au	Resource : 300,000 t of 0.15 opt Au.	San Paulo Expl. Inc. (CMH, 1990-91, p.393)	CMH, 1990-91, p.393	Inactive, Patents K3594-3595
Gibbons Quarry (52E/9NW)	Slate	Produced : unknown Reserves : open	Unknown, W.L.L. C2366	MDC 27, p.58	Inactive quarry, Patent P156.
Golden Star Mine (52C/10NE)	Au	Produced : 10,758 oz Au and 34 oz Ag from 19,345 tons. Reserves: 20,000 tons of 0.42 opt Au and 35,000 tons of 0.15 opt Au (tailings dump).	PIRP Holdings Inc., AF 52C/10NE	MDC 16, p.20	Inactive, Patented Claim AL116, Leased Claim K44632
Goldlund Mine (52F/16NW)	Au	Produced : 111,891 @ 0.15 opt Au (Dec. 84). Reserves : 781, 000 t of 0.14 opt Au with 150,000 t. of 0.15 opt Au mineable by open pit.	Goldlund Mines Ltd	AF 52F/16NW 081 Locke Riche Minerals Ltd. CMH 95-96, p.223	Inactive. Patented claim KRL 18802
Gordon Lake Mine (52L/7NW)	Cu, Ni, PGE	Produced : 1,632,216 t of 0.78% Ni, 0.41% Cu and 0.026 opt Pd (Dec.71) Reserves : 110,000 t of 0.85% Ni and 0.35% Cu (Dec.71)	Unknown (formerly Cons. Canadian Faraday Ltd. then changed to Metal Mines Ltd.)	SMDR 000506 (edited)	Inactive, Mining Patents KRL 19096-97, 29065-66, 30055, 31373-74, 31823-26, 31829-32, 33206,33208,33210, 36272-74.
Grindstone Lake (52E/16NW)	Aggreg	Production : unknown Reserves : open	Open Crown Land (formerly CNR)	MDC 27, p.22	Inactive Quarry, Open Crown Land
Gummeson (52G/5NW)	Stone	Produced : 50 ft^3 Reserves : Open	Kenora Granite Company Ltd.	MDC 27, p.22	Staked Claim 1185052
Hawk Lake Quarry (52F/13SW)	Aggreg.	Quarry : 400m x 200m x 30m *numerous crushed stone and sand piles on site (1993) Est. Production : 6.5 Mt Reserves : open	Unknown (formerly CPR)	AMIS Study 1993 MNDM	Inactive Quarry, Under OLL sites (1242, 1255, 1262)
High Lake Prospect (52E/11NE)	Cu, Mo, Au	Zone : 2000-foot long by 250-wide containing assay values of 0.10% to 1.35% Cu and 0.01 to 0.05 opt Au.	Celyn Alcock, Kenora, Ontario	GR 41, p.46	Inactive, leased claim K32307
Horne Granite-Butler Station (52G/5NW)	Stone & Aggreg.	Production from 1888-1989 and produced 633 m^3 in 1989 By Nelson Granite. Reserves : open	J. & E. Hepp Duluth, MN (formerly CPR)	MDC 27, p.26	Inactive Quarry, Patents K561, K562, K563, K599 and K600

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Junction Granite (52E9NW)	Aggreg	Quarry : 250m x 35m x 15m Est. Production : 131,250 m^3 Reserves : none (used for road construction purposes only)	Unknown	Personal Comm. MTO Staff	Inactive , Patented land K5953
Kenbridge Prospect (52F/5NE)	Ni, Cu	Resource : 3,271,390 tons of 1.06% Ni and 0.54% Cu.	CMH, 1986-87, p.209 (Falconbridge Ltd)	GR 111, p.44	Inactive, patented claims K6672, K6634, K6635
Kenricia Mine (52E/10NE)	Au, Ag	Produced : 2,553 oz Au and 521 oz Ag from 24,344 tons Reserves : 53,201 tons @ 0.362 opt Au (1935).	Unknown	MDC 16, p.23 AF 52E/10NE E-1	Inactive, Patented Mining Land P211
Laurentian Mine (52F/7NE)	Au	Produced : 8,143 oz from 19,950 tons (grade 0.41opt). Reserves (Au) : Proven and Probable 50, 650 t @ 0.25 opt and Speculative 20,000 t @ 0.10 opt on dump	Unknown	MDC 16, p.24 OFR 5332, p.37 Table 8	Inactive, Patented Mining Land HP 371
Little Turtle Lake Soapstone Quarry (52C/15SE)	Soapstone	Produced : 17 tons (1922-23) Reserves : open	Unknown	MDC 27, p.85	Inactive Quarry, Patented claim HP 141
Lockhart Lake (52C/10SW)	Zn, Cu, Au, Ag	Reserves : 6.1 Mt @ 1.06% Zn, 0.27% Cu, 3.2 g/t Ag and 0.006 g/t Au	Falconbridge	AF 52C/10NE Y-6 (Minnova 1989)	Inactive, Patented claims K417852-854, K418156-157, K446504-509.
Lyon Lake Zone (52G/15NW)	Cu, Zn, Pb, Ag	Original Resource : 3.945 Mt @ 6.53% Zn, 1.24% Cu, 0.63 % Pb, 3.42 opt Ag and 0.01 opt Au. Reserves : 695,000 tons of 10.34% Zn, 0.75% Cu, 1.62% Pb and 5.96 opt Ag	Noranda Inc. CMH 1992-93 p.256	CMH 1979-80, p.194 (Noranda) CMH 1990-91 p.332 (Noranda)	Closed Mine, Patented claim CLM 185
Marchington Road Deposit (52J07SE)	Cu, Zn, Pb, Ag	Resource : 150,000 tons @ 0.98% Cu, 3.11% Zn, 1.16% Pb, 1.97 opt Ag	Umex Inc. AF 52J/7SW 0024	Umex Inc. AF 52J/7SW 0024	Inactive, Patented claim CLM 337
Mavis Lake Prospect (52F/15SE)	Li, Ta	Reserves : 500,000 tons of 1% Li_2.	CMH, 2001-2002, p.259, (New Claymore Resources Ltd.).	OFR 5718, p.151	Inactive, Leased claims K498288, K498289, K498290, K498292, K498308, K498140
Mattabi Mine (52G/15SW)	Cu, Zn, Pb, Ag	Original Resource : 13.66 Mt @ 7.50% Zn, 0.80% Cu, 0.77% Pb and 3.10 opt Ag. Reserves : 387,000 tons of 0.13% Cu, 9.28% Zn, 0.58% Pb and 1.77 opt Ag	Noranda Inc. CMH 1998-89 p.338	GR 221 p. 4 CMH 1988-89 p.338 (Noranda)	Closed Mine, Patented claims GTP Block 7
Maybrun Mine (52F/5NE)	Cu, Au	Production : 125,000 t @ unknown grades (Aug.73 to Dec.74). Resource : 2,824,825 t of 1.18 % Cu and 0.08 opt Au (1966)	CMH, 1995-96, p.108 (Consolidated Maybrun Mines Limited)	MDIR K0203 AF 52F/5NE P-1	Inactive, property on care and maintenance, Patented claims K15364-K15381, K15524- K15527

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Mikado Mine (52E/10SW)	Au	Produced : 28,335 oz Au and 41 oz Ag from 57,813 tons Reserves (Au): Probable : 200,00 t at unknown grade with 30,977 t at 0.356 opt Au in the Grano Zone.	Kenora Prospectors and Miners	MDC 16, p.27 OFR 5695, p.220	Inactive, Patented mining claim D148
Mironsky Prospect (52C/11NE)	Cu	Zone : 122m long by 10m wide zone to a minimum depth of 90m averaging 0.53-1.01% Cu. Resource : 300,000 tons of 0.8% Cu (estimated).	Bond and Clark & Eveligh	MDC 29, p.42	Inactive, Staked claim 1238036
Nelson Granite – Forgotten Lake (52L/1SW)	Stone	Produced :5,278 m^3 (97-00) Reserves : open	Nelson Granite And C. Nelson	ROA 1998-2001	Active Quarry, Leases CLM 427 and 13 Claims
Nelson Granite – Red Deer Quarry (52L/1SW)	Stone	Produced : 4,851 m^3 (96-00) Reserves : open	Nelson Granite OFR 6047	ROA 1997-2001	Active Quarry, Leases 420, 9597, 9598, and 12 Claims
Nelson Granite – Scotstown (52F/13SE)	Stone	Quarry : 140m x 50m x 10m Est. Production : 70,000 m^3 Now amalgamated with the quarry south of the highway.	Nelson Granite	AMIS survey 1993 MNDM	Active Quarry, Patents 594148, 11084 and 110885, Leases CL8436 and 8734 Claims 855993-94.
Nelson Granite – Shepody Quarry (52L/1SE)	Stone	Produced : 71 m^3 (2000) Reserves : open	C. Nelson (Nelson Granite)	ROA 2001	Active Quarry, Claim 1178164
Nelson Granite – Snook Lake Quarry (52L/2NE)	Stone	Produced : 368 m^3 (2000) Reserves : open	Nelson Granite	ROA 2000-2001	Active Quarry, Claims 1003742 and 1003744
Nelson Granite – Vermilion Bay (52F/13SE)	Stone	Produced : 40,258 m^3 (94-00) Reserves : open	Nelson Granite	ROA 1995-2001	Active Quarry, Patent K59147, Lease CL4971, Claim 1220637
New Campbell Island Mines (Richard Lake) Prospect (52F/13SW)	U	Zone : 213m x 3m x 300m Resource : 650,000 tons of 0.10% U_3O_8	Unknown	GR 130, p.46	Inactive, Patented claim K18761
Norpax Mine (Reynar Lake) (52L/6NE)	Ni, Cu	Resource : 1,010,000 tons of 1.2% Ni and 0.5% Cu.	CMH, 1995-96, p.149 (Falcon Point Resources Ltd.)	Norpax Nickel Mines Ltd., AF	Inactive, Patented claims KRL350101 and KRL34767
Northern Penisula Mariposite (52E/10NE)	Mariposite	Zone : over 700m long x 7-8m thickness at a vertical dip. Produced : unknown (72-76). Reserves : open	R. Theriault	MDC 27, p.63	Inactive, Staked claim 1178801
North Kaskaweogama Prospect (52J/07NW)	Fe	Reserves : proven 405,000 t @ 28% Fe in 4 zones and a possible 50 Mt at unstated grade.	Open Crown Land	MDC 11, p 443	Inactive, Open Crown Land
North Pines Mine (52K/1SE)	Pyrite	Produced : 500,000 tons at 28% Fe (1909-21). Reserves : open	Allied Chemical	GR 101, p.36	Inactive, Patented claim HW 715

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Northrock Mine (South Grassy) (52C/11NE)	Cu	Zone : 400m x 2-30m x 91m Reserves : 1,020,458 tons of 1.17 % Cu including 265,230 tons of 2.08% Cu.	Bond and Clark & Eveligh	OFR 5512, p.50	Active, 8 Staked claims.
Pidgeon Molybdenum Mine (52F/16NW)	Mo	Resource : 275,000 tons of 0.6 % Mo.	Unknown	OFR 5519, p.113 MRC 7, p.38	Inactive, Patented claim Pa 14051
Pinewood Peat (Peatland 52D-32) (52D/16SW)	Peat	Area : 1,180 Ha at 3.8 m deep Production : unknown Resource : 36.9 x 10^6 m^3	Unknown	OFR 5489,Vol.4 p.1-22	Inactive, Patented land
Pipestone Penisula Soapstone Quarry	Soapstone	Zone : Over 500m long x 23m wide and vertically dipping. Produced : four carloads Reserves : open	Open Crown Land, W.L.L. C-2366	MDC 27, p.89	Inactive quarry, Open Crown Land, W.L.L. C-2366
Polar Bear (Arctic Peat Moss) (Peatland 52C-44) (52D/12SE)	Peat	Area : 3,225. Ha @ 4.1m deep Volume : 110.5 x 10^6 m^3 Production : 15, 575 t (41-52) Reserves : open	Open Crown Land	OFR 5489, Vol.7 p.1-25 GR 107, p.28	Inactive, Open Crown Land
Port Arthur Copper (51C/15SE)	Cu, Zn	Produced : 26,509 lbs. Cu Est. Reserves: 48,895 tons of 1.18% Cu and 0.43% Zn.	W. Plamondon	Raoul Property Visit (2000)	Inactive, patented claim FF4261
Purdex Prospect (A-D Zones) (52E/11NE)	Au	Reserves: 1) 76 500 tons of 0.308 opt Au (indicated tonnage in 4 zones). 2) 241 000 tons at 0.226 opt Au in the P,A,B and C zones.	Unknown	OFR 5695, p.273 CMH, 1995-96 p.233	Inactive, patented claims K25130-131
Quarry Island (52E/15SE)	Aggreg.	Quarry : 50m x 30m x 1-4m Est. Production : 3000 m^3 Reserves : open	Unknown (formerly CPR)	Site Visit by RGP Personnel 2000.	Inactive quarry, Patented Land.
Quarry Island (52E/9NW)	Stone Piers	Production : 30m long face Reserves : open	Unknown (formerly CPR)	MDC 27, p.21	Inactive quarry, Patented Land.
Rainbow Quarry (52K/1SE)	Mariposite	Trench: 46.5m x 1-3m x 1-2m Est. Production : 186 m^3 Reserves : open	C. Kuryliw	MDC 27, p.58	Inactive quarry, Staked claim 1162920
Rainy River Zone 17	Au	Resource : 25.2 Mt @ 1.37 g/t Au	Nuinsco Resources	Nuinsco Resources Information Session Handout Wed., Sept.28/98	Active, Patented Land.
Regina Mine (52E/8NE)	Au, Ag	Produced : Over 8,000 oz Au & 1,460 oz Ag from 36,828 tons. Reserves (Au) : Speculative 19,650 t @ 0.44 opt and 30,000 t @ 0.106 opt in tailings.	Unknown	MDC 16, p.34 AF 52E/8NE Q-1 NM 07/25/88, p.7 Sweaney Gold Corp	Inactive, Patented claims P566-67
Revell Batholith (52F/9SW)	Stone	Quarry : 12m x 4.5m x 1m Est. Production : 54 m^3 Reserves : open	Unknown	MDC 27, p.40	Inactive quarry, Patented land Lot 8, Conc. 2 Revell Township
Rush Bay Quarry (52E/10NW)	Flagstone	Quarry : 100m x 12m x 4 m Est. Production : 4800 m^3 (1978-86) Reserves : open	Canadian Shield Construction	MDC 27, p.59 (86)	Inactive quarry, Alienation 1516 (Rock Aggregate Permit)

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Sakoose Mine (52F/9SW)	Au, Ag	Produced : 3,669 oz Au and 145 oz Ag from 8,828 tons. Reserves : 50,000 t @ 0.41 opt. Au.	Cantera Mining Limited	MDC 16, p.36	Inactive, Staked claim 1244771.
Scramble Mine (Homestake) (52E/16SW)	Au	Zone : 366m to 457m by 3.7m wide zone at 0.15 opt Au. Resources : 150,000 t at 0.24 opt., 1,500 t at 0.24 opt and 70, 000 oz (at 0.05 opt. cut-off) drill indicated.	Abitibi Consolidated Ltd.	NM 07/25/88 (Madeline Mines Ltd.) CIMM, Dist.4 Field Trip Guidebook, p.44	Inactive, Jaffray Twp., Con.6, Lot 13 and 14
Rocky Islet (CNR Quarry) (52C/11NE)	Ballast	Produced : 234,000 m^3 (1970) Reserves : open	Unknown (formerly CNR)	MDC 27, p.11	Inactive quarry, Patented land G-729.
Straw Lake Beach Mine (52F/3SW)	Au, Ag	Produced : 11,568 oz Au and 1,049 oz Ag from 33,662 tons. Reserves (Au) : Probable 32,000 t @ 0.20 opt Possible 32,000 t @ 0.20 opt and 30,000 t @ 0.15 opt Spec. 48,000 t @ 0.20 opt	Unknown	MDC 16, p.38 OFR 5332, Table 14, p.47	Inactive, 10 Patented mining claims K4021-4022, K4035-4040, K9037-9040.
Sultana Mine (52E/9NW)	Au	Produced : 15,977 oz. Au from 77,481 tons (0.21 opt). Reserves : none available	Patent is unknown, Claim-A. Robercecki	MDC 16, p.38	Inactive, Patented mining claim K489932 and claim 1086199
St Anthony Mine (52J/02SE)	Au	Produced: 331,069t @ 0.19 opt Reserves: 37,800t @ 0.18 opt	Unknown	MDC 13 p. 295	Inactive, Patented claim BG 154
Sturgeon Lake Mine (52G/15NW)	Cu, Zn, Pb, Ag	Original Resource (Dec/74) : 2.10 Mt @ 10.64% Zn, 2.98% Cu, 1.47% Pb, 6.14 opt Ag and 0.021 opt Au. Reserves (Dec/78) : 599,000 tons @ 2.34% Cu, 8.98% Zn, 1.30% Pb, 5.17 opt Ag and 0.018 opt Au.	Falconbridge	GR 211, p.4 CMH 1980-81, p. 102 (Falconbridge)	Inactive, Patented claim
Tabor Lake Mine (52F/9SW)	Au, Ag	Produced : 36 oz Au and 4 oz Ag from 87 tonnes. Indicated : 50,000 t @ 0.5 opt	Sulpetro Minerals Ltd., AF	MDC 16, p.39	Inactive, 37 patented claims, mine site on K502044
Thunder Lake Deposit (52 F/15SE)	Au	Resource : drill-indicated 3.78 Mt averaging 7.02 g/t Au (equivalent to 853,000 oz Au)	CMH, 1999-00, p.125 (Corona Gold Corp.)	CMH, 1999-00, p.125 (Corona Gold Corp.)	Inactive, Patented and Staked claims.
Trap Lake	Soapstone	2 Zones : Islands 246 & 249 (16.3 Ha and 0.3 Ha). Resource : open	Unknown	MDC 27, p.90	Inactive, Patented land K3829
Vanlas Prospect (Kidd Zone) (52F/10NW)	Au	Resource : 100,000 t of 0.20 opt Au.	Power Expl. Inc. Annual Report, 1988	Power Expl. Inc. AF 52F/10NW UU-1	Inactive, patented claim K70627
Victor Island Prospect (52F/5SE)	Au	Reserves : Drill indicated 300,000 t at 0.12 opt Au to a depth of 213m.	CMH, 1997-98 p.346 (Nuinsco Resources Ltd.)	MP 128, p.16	Inactive, patented claim K4712 Claims 690655, 718785
Wabigoon Prospect (52F/10NE)	Soapstone	2 Zones of 15-20m wide by 600m long Resource : open	Unknown	MDC 27, p.91	Inactive, Patented mining land HW 133

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Watcomb Ballast Quarry (52G/14SW)	Ballast	Produced 130,000 tons/year from 1971-1991 (2.6 Mt)	Open Crown Land (Formerly CPR)	OFR 5889, p.27	Inactive quarry, Open Crown Land
Wendigo Mine (52E/9NW)	Au, Ag, Cu	Produced : 67,423 oz Au, 14,762 oz Ag and 1.89 million lbs. of Cu from 206,054 t Reserves (Au) : Vein 1 : 110m x 0.8m @ 0.33 opt Au (all of the production was from this zone). Vein 2 : 118m x 0.6m Vein 3 : 180m x 0.3m Vein 4 : unknown Tailings : 61,970 @ 0.027 opt Au.	Unknown	SMDR 001350 SMDR 001350 OFR 5695, p.352 OFR 5695, p.353	Inactive, Patented mining claims MH 208-210.
Werner Lake Cobalt (52L/7NW)	Co, Cu	Produced : recovered 389,363 lbs. of Co (1932, 1940-44); grades 2% Co and 0.75% Cu. Reserves : 1.01 Mt @ 0.31% Co and 0.29% Cu.	Canmine Resources	MDC 1, p.37 Canmine Resources Press Release Feb. 9, 1999	Inactive, Patented mining claim KRL 9383.
Whitedog Quarry (52L/2SW)	Aggreg & Stone	Production : unknown Reserves : open	Kenora Granite Company Ltd.	MDC 27, pg.45	Staked claim K1184320
White Quarry (52E/14NE)	Aggreg	Quarry : 650m x 120m x 20m Est. Production : 4.2 Mt Crushed Stone : 258,000 m^3 on site (1993) Reserves : open	Unknown (formerly CNR)	AMIS Survey 1993 MNDM	Inactive quarry, Patented mining land CL 743
Wind Bay Prospect (52C/10NW)	Zn, Cu	Zone : 1300m x 46m x 10m Est. Resource : 1.79 Mt of 1.5% Zn and 0.2% Cu.	Unknown	OFR 5512, p.89	Inactive, Patented mining claim 594P

Other abbreviations: g/t, grams per ton; Mt, million tons; opt, ounces per ton.

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

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